CATALOG

Harvard School of Public Health

Advancing the Public's Health Through Learning, Discovery, and Communication

Harvard School of Public Health – Departments and Degree Programs, 2002–03

Definition of Terms

Degrees

DPH Doctor of public health

MOH Master of occupational health

MPH Master of public health

PhD Doctor of philosophy

SD Doctor of science

SM1 Master of science (40-credit program)

SM2 Master of science (80-credit program)

Diplomas for the MPH, DPH, and MOH degrees show the degree only. Diplomas for the SM and SD degrees also show the name of the department.

All PhD programs are offered under the aegis of Harvard University's Graduate School of Arts and Sciences.

Concentrations

The names of the departments generally convey their educational and research specialization, or *concentration*. Where several concentrations are available within a department, these are listed in the chart at right. In the Department of Environmental Health only, the concentrations are shown on diplomas. Areas of interest, described in this catalog but not listed at right, are generally less formal programs than concentrations or are subspecializations within them.

Department of Biostatistics

Biostatistics
SM1, SM2, SD

Health decision sciences
SM2, SD

Department of Cancer Cell Biology

SD
PhD (through the Division of Biological Sciences)

Department of Environmental Health

Environmental epidemiology
SM1, SM2, SD

Environmental science and engineering
SM1, SM2, SD

Occupational health
MOH, SM1, SM2, SD, DPH

Physiology
SD
PhD (through the Division of Biological Sciences)

Population genetics
SD

Department of Epidemiology

SM1, SM2, SD, DPH

Department of Health and Social Behavior

SM1, SM2, SD

Department of Health Policy and Management

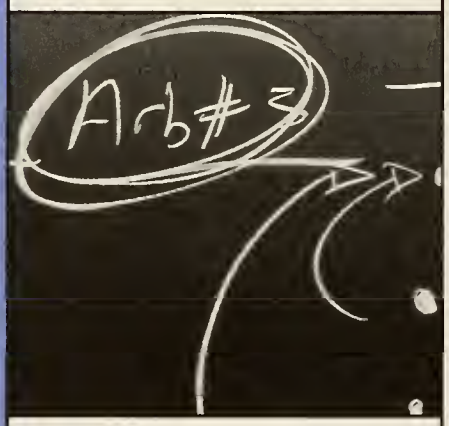
Health care management
SM1

Health policy and management
SM1, SM2, SD

Health policy
PhD (through university program)

Department of Immunology nd Infectious Diseases

SD
PhD (through the Division of Biological Sciences)



Department of Maternal and Child Health

SM1, SM2, SD, DPH

Department of Nutrition

Nutritional epidemiology

Public health nutrition
SD, DPH

PhD (through the Division of Biological Sciences)

Department of Population and International Health

International health epidemiology and ecology
SD, DPH

International health policy and economics
SD, DPH

Population and international health
SM2

Population and reproductive health
SD, DPH

Master of Public Health Program

Clinical effectiveness

Family and community health

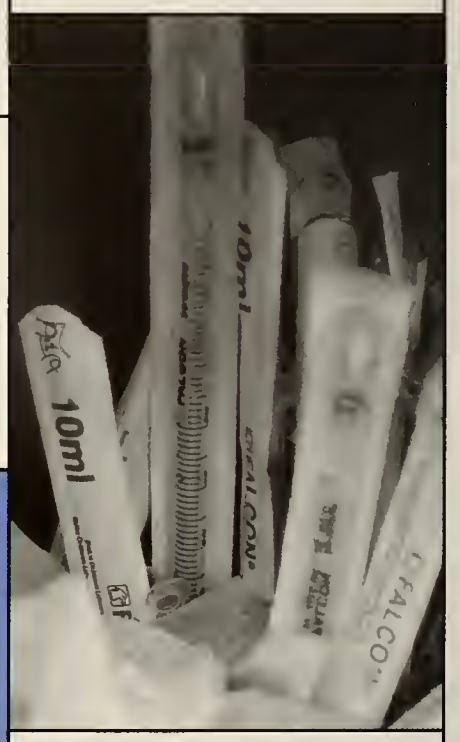
Health care management

International health

Law and public health

Occupational and environmental health

Quantitative methods
MPH



Division of Biological Sciences

Cancer cell biology

Environmental health physiology

Immunology and infectious diseases

Nutrition
PhD

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Harvard School of Public Health Academic Calendar, 2002–03

July 1	Registration for summer programs
July 2	Summer Program in Clinical Effectiveness and Summer Session for Public Health Studies begin
July 2–26	Summer 1 term inclusive
July 4	Independence Day, a holiday
July 29–August 16	Summer 2 term inclusive
August 19–30	English for Professional Communication Program
September 2	Labor Day, a holiday
September 3	Fall semester registration for new students
September 3–6	New-student orientation
September 6	Fall semester registration for returning students
September 9	Fall 1 term begins
October 14	Columbus Day, a holiday
October 25	Fall 1 term ends
October 28	Fall 2 term begins
November 11	Veterans Day, a holiday
November 28–December 1	Thanksgiving recess
December 15	Final deadline for application to all doctor of science (SD) and master of science (SM) programs; deadline for application to master of public health (MPH) and master of occupational health (MOH) programs in the priority admission cycle.
December 16	Final deadline for application to all doctor of philosophy (PhD) programs
December 20	Fall 2 term ends
December 21–January 1	Winter recess
January 2	WinterSession* begins
January 20	Martin Luther King, Jr., Day, a holiday
January 28	WinterSession ends
February 3	Spring 1 term begins
February 17	Presidents' Day, a holiday
March 21	Spring 1 term ends
March 22–30	Spring recess
March 31	Spring 2 term begins
May 23	Spring 2 term ends
May 26	Memorial Day, a holiday
June 5	Commencement

* WinterSession is a special academic term at HSPH offering opportunities for creativity and innovation in learning and teaching. Credit and noncredit courses and activities for WinterSession, as well as relevant school and departmental policies, are listed at the following Web site: http://www.hsph.harvard.edu/registrar/WinterSession/index.shtml

From the Dean

The twentieth century has witnessed the greatest gains in quality and duration of life. Most of the gains achieved prior to antibiotics and vaccines are truly attributable to public health. In the United States, for example, life expectancy has been extended from an average of 47 years in 1900 to almost 80 years in 2002. Yet there are major disparities in life expectancy and harsh inequities in individuals' ability to get access to the care they need—both in different parts of the world and within this wealthy country. Some infectious diseases have been vanquished, but new ones such as AIDS emerge or reemerge in drug-resistant strains. Violence, injuries, the great parasitic diseases that kill and handicap millions, environmental and occupational hazards, and health management and financing issues are just some of the challenges within the purview and mandate of public health. The improvement of the health of the nation's and the world's populations demands diverse professional skills combined with the integration of varied disciplines.

The courses, departments, centers, programs, and facilities described here in the catalog of the Harvard School of Public Health reflect the scope of the contemporary public health enterprise. The interests and expertise of faculty at the school are similarly broad, extending across the biological, social, and numeric sciences. There are programs and projects ranging from the molecular biology of AIDS vaccines to the epidemiology of cancer; from women's and children's health to quality-of-care measurement; from risk assessment to international health and human rights. All of these programs are approached with a true sense of dedication on the part of the faculty, students, and staff and with a mutual respect for different ways of contributing to our shared purpose.

Our overarching mission is to advance the public's health through learning, discovery, and communication. Our objectives are to provide the highest level of education for public health scientists, practitioners, and leaders; to foster new discoveries leading to the improved health of the people of this country and all nations; to strengthen health capacities and services for communities; and to inform policy debate, disseminate health information, and increase awareness of public health as a public good and a fundamental right.

We are engaged in an enterprise of vital importance to every individual and to society. We welcome those who wish to help us meet these challenges and share the satisfying work of changing the world of health and improving the health of the world.

Barry R. Bloom
Dean

The Harvard School of Public Health

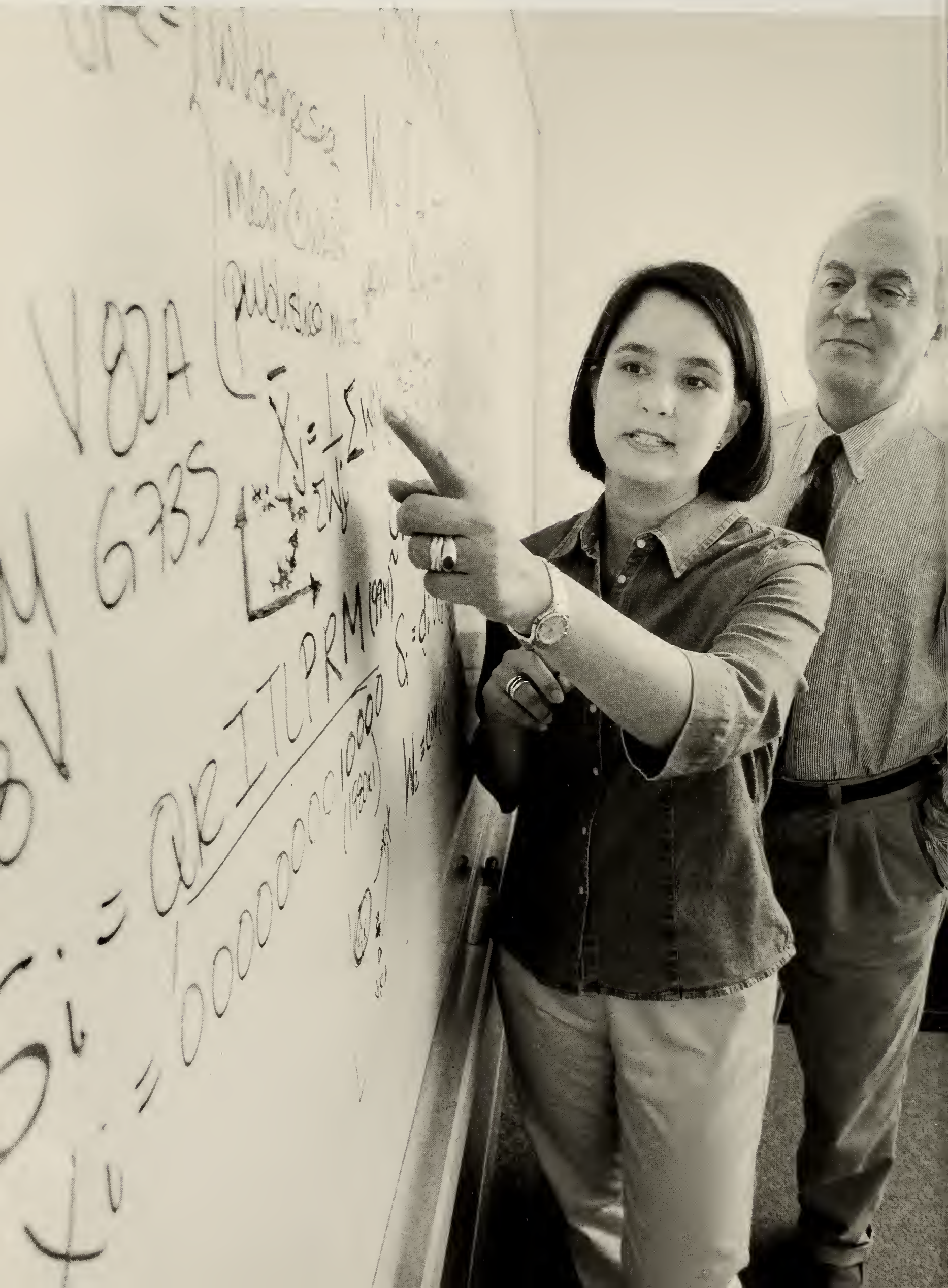
The Harvard School of Public Health (HSPH) is a direct descendant of the first professional training program in public health in America, the Harvard-MIT School for Health Officers, a joint venture that began in 1913. In 1922 Harvard split off from MIT, and the Harvard School of Public Health was formally established. In 1946 the school celebrated its new status as a freestanding faculty of Harvard University, no longer an administrative part of the medical school.

Since its founding, the school, through its faculty and graduates, has been at the forefront of efforts to stem disease and promote health worldwide. During the early years the focus was on infectious diseases, deadly workplace exposures, and sanitation—from Alice Hamilton's pioneering studies of lead and mercury poisoning, to Thomas Weller's path-breaking research on the polio virus and Philip Drinker's invention of the iron lung. More recently the school has expanded its reach to new areas, including the effects of race, gender, class, and social isolation on health; the reform of national health systems; and cutting-edge research on the biomarkers of disease. Three Nobel Prizes, a Lasker Prize, two MacArthur Awards, presidential citations, and countless other honors attest to the excellence and impact of this work. Five successive HSPH alumni led the U.S. Centers for Disease Control and Prevention (1962–1989) for an unprecedented 27 years. More difficult to quantify—but a far better gauge—are the perceptible gains in length and quality of life that have been realized through all these efforts.

Today the faculty of the Harvard School of Public Health includes almost 350 members from the diverse fields and disciplines that constitute public health. The student body comprises over 900 individuals from throughout the United States and five dozen other countries. Students, like faculty, come from an array of fields, and include physicians (30 percent of the student body), health services administrators, epidemiologists, nurses, dentists, lawyers, statisticians, environmental scientists, engineers, research assistants, psychologists, and social workers. Approximately one third of HSPH students are enrolled in the interdisciplinary master of public health (MPH) program, one third in master of science programs, and one third in doctoral (doctor of science, doctor of public health, or doctor of philosophy) programs.

The school is organized into ten academic departments, the locus of most teaching and researching activity; two interdisciplinary divisions (Biological Sciences and Public Health Practice); the Office for Professional Education (for the MPH program); and thirteen specialized research centers. The school's academic programs are described in detail here in the catalog.

Department of Biostatistics



Biostatistics involves the theory and application of statistical science to analyze public health problems and to further biomedical research.

The faculty includes leaders in the development of statistical methods for clinical trials and observational studies, studies on the environment, and genomics/genetics. The department's research in statistical methods and interdisciplinary collaborations provide many opportunities for student participation.

Current departmental research on statistical and computing methods for observational studies and clinical trials includes survival analysis, missing-data problems, and causal inference. Other areas of investigation are environmental research (methods for longitudinal studies, analyses with incomplete data, and meta-analysis); statistical aspects of the study of AIDS and cancer; quantitative problems in health-risk analysis, technology assessment, and clinical decision making; statistical methodology in psychiatric research and in genetic studies; Bayesian statistics; statistical computing; statistical genetics and computational biology; and collaborative research activities with biomedical scientists in other Harvard-affiliated institutions.

Degree Programs in Biostatistics

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs and a doctor of science (SD) program with a concentration in biostatistics, as well as an 80-credit SM program and an SD program with a concentration in health decision sciences. Detailed information about requirements and elective options can be found in a handbook distributed by the department. A master of public health program in quantitative methods and a doctoral program in molecular epidemiology are described in the interdisciplinary section of this catalog. For information about schoolwide requirements for master's and doctoral degrees, see page 59.

The programs offered by the Department of Biostatistics provide rigorous training in the development of methodology, collaboration, teaching, and consultation on a broad spectrum of health-related problems. The department prepares students for academic and private-sector research careers in the fields of biostatistics and health decision sciences. Recent graduates have assumed faculty posts at universities, as well as positions in research laboratories, federal government centers, pharmaceutical companies, and research institutes.

Applicants to the department should have successfully completed calculus through multivariable integration and at least one semester of linear algebra and have knowledge of a programming language such as FORTRAN or C. In addition, applicants are strongly encouraged to have completed courses in probability, statistics, advanced calculus, and numerical analysis. Practical knowledge of a statistical computing package such as SAS, SPSS, S-PLUS, or Stata is also desirable.

Funding is available to qualified students pursuing the doctoral degree. Most of the funding is through five biostatistics training grants in AIDS, cancer, the environment, mental health, and public health training for underrepresented minorities. These traineeships require U.S. citizenship or permanent residency. Other limited funding is awarded on a competitive basis to qualified applicants.

Master of Science in Biostatistics (80-credit and 40-credit programs)

Biostatistics The main purpose of the 80-credit and 40-credit SM programs with a concentration in biostatistics is to prepare students for doctoral study, although a limited number of qualified students may pursue the master's degree only.

For the 80-credit program 2.5 credits must be used to fulfill the schoolwide epidemiology requirement, and 25 credits must be earned in core courses on probability theory and applications, statistical inference, methods, and regression and analysis of variance. An additional 15 credits must be chosen from biostatistics courses, of which 10 credits must be selected from a specific list of biostatistics, health policy and management, and interdisciplinary offerings. In addition to formal course work, students acquire experience in the planning of experiments and the analysis of data by participating in a consulting seminar. Students also choose from a variety of elective courses.

The 40-credit program is designed for students who have a master's degree in one of the mathematical sciences or a doctorate in a quantitative field. Applicants must have a mathematical and statistical background sufficient to achieve a level of proficiency after one year of study comparable to that attained in the 80-credit program. As courses must be taken out of sequence to complete the program in one year, considerable background in probability and statistical inference is needed.

The requirements for this degree are essentially the same as for the 80-credit program. The 25-credit core must be completed, although students who have taken equivalent course work elsewhere may petition to substitute more advanced courses. More flexibility is allowed in other requirements since only 40 total credits are required. Other courses are selected in consultation with a faculty adviser.

Health Decision Sciences The concentration in health decision sciences offers integrated educational training in decision sciences within the context of health problems. This program, which draws on courses offered by the Departments of Biostatistics and Health Policy and Management, requires 80 credits. A 40-credit program is not offered.

Of the 80 credits necessary to earn the SM, 2.5 credits must be used to fulfill the schoolwide epidemiology requirement, and students must complete core courses in decision analysis for health and medical practices or for clinical research, methods, theory, management science, probability theory and applications, statistical inference, and computing; a research seminar; and a practicum. Ten additional credits must be earned from the health decision sciences core and extended core. The consulting requirement may be met by obtaining practical experience under the tutelage of a faculty member. Students also choose from a variety of elective courses.

Doctor of Science in Biostatistics

Biostatistics The doctoral concentration in biostatistics is designed for those who have demonstrated both interest and ability in scholarly research. Qualified applicants may apply to the doctoral program without a prior advanced degree.

Beyond the schoolwide requirement of introductory epidemiology, the course work for the program is built on a 30-credit core curriculum similar to that for the master's degree (see above). In addi-

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Introduction to SAS
Principles of Biostatistics—Introductory, I, and II
Introduction to Statistical Methods
Statistics for Medical Research-Introductory, II, Advanced, and Translational
Analysis of Rates and Proportions
Regression and Analysis of Variance in Experimental Research
Survey Research Methods in Community Health
Applied Regression for Clinical Research
Principles of Clinical Trials
Basics of Statistical Inference
Applied Survival Analysis and Discrete Data Analysis
Survival Methods in Clinical Research
Applied Longitudinal Analysis
Fundamental Concepts in Gene Mapping
Statistical Genetics in Complex Human Disease
Probability Theory and Applications I and II
Statistical Inference I and II
Methods I and II
Research Synthesis and Meta-Analysis Applications in Public Health and Clinical Medicine
Regression and Analysis of Variance
Sample Surveys
Nonparametric Methods
Analysis of Failure Time Data
Analysis of Multivariate and Longitudinal Data
Design of Scientific Investigations
Advanced Statistical Computing
Bayesian Methodology in Biostatistics
Statistical Problems in Drug Development
Computational Methods for Categorical Data Analysis
Statistical Methods in Human Genetics
Statistical Science Outreach
Statistical Computing Environments
Applied Stochastic Processes and Models in Public Health
Operational Mathematics
Computational Biology
Smoothing in Biostatistical Modeling
Decision Analysis for Health and Medical Practices
Methods for Decision Analysis in Public Health and Medicine
Cost-Effectiveness and Cost-Benefit Analysis for Health Program Evaluation
Spatial Statistics for Health Research
Independent Study, Field Experience

tion, 25 credits of biostatistics courses are required; these courses are chosen by the student in consultation with an adviser. Students must also complete two minors (10 credits each), only one of which may be quantitative (such as theoretical statistics, health decision sciences, or epidemiologic methods), whereas the other must be substantive (such as the biology of cancer or AIDS).

Doctoral students are required to participate as a teaching assistant in a course offered by the department and to take a consulting seminar.

Health Decision Sciences The doctoral concentration in health decision sciences offers integrated educational training in decision analysis, cost-benefit and cost-effectiveness analysis, behavioral decision theory, operations research, applied welfare economics, statistical inference, computer science, and biostatistics—all within the context of health problems. This program is coordinated with but distinct from the decision sciences concentration in the universitywide PhD Program in Health Policy, described in the Department of Health Policy and Management.

The program requires 45 credits of course work in the major field, plus 10 credits in each of two minor fields, one of which must be biostatistics. Health policy and management is acceptable for the other minor, provided the courses focus on subject-oriented rather than quantitative material.

The course work includes the schoolwide requirement of introductory epidemiology; probability theory and applications; statistical theory; 30 credits from the health decision sciences core; and 10 credits from the extended core. The last includes courses in economic analysis, decision analysis for health and medical practices or for clinical research, methods, cost-effectiveness and cost-benefit analysis, decision theory, management, and analytical methods; a research seminar; and a practicum.

All doctoral students are required to participate as a teaching assistant in a course offered by the department. Students must also take a consulting seminar or complete an outside project approved by the seminar director.

RELATED OFFERINGS

Interdisciplinary concentration in molecular epidemiology, see page 57.

MPH concentration in quantitative methods, see page 55.

PhD Program in Health Policy, see page 33.

CONTACT INFORMATION

For more information about research and training in biostatistics, please contact David Wypij, director of student admissions and advising, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1056
Fax: 617-739-1781
E-mail: dept@hsph.harvard.edu
Web: http://www.biostat.harvard.edu

For more information about research and training in health decision sciences, please contact Milton C. Weinstein, PhD, Department of Health Policy and Management, 718 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0805
E-mail: mcw@hsph.harvard.edu

For information on postdoctoral fellowships, please contact the chair of the Postdoctoral Committee, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1056
Fax: 617-739-1781
E-mail: dept@hsph.harvard.edu

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Stephen W. Lagakos, MPhil, PhD; Henry Pickering Walcott Professor of Biostatistics. Statistical methods in AIDS research; clinical trials.

Rebecca A. Betensky, PhD; Associate Professor of Biostatistics. Sequential analysis; correlated binary data.

Marco Bonetti, MS, PhD; Assistant Professor of Biostatistics. Clinical trial and growth data; stochastic geometry and applications to disease spatial clustering.

Paul J. Catalano, SD; Lecturer on Biostatistics. Repeated measures; multivariate models; dose-response modeling; risk assessment; environmental statistics.

Brent A. Coull, MS, PhD; Assistant Professor of Biostatistics. Categorical data analysis; generalized linear mixed models; generalized additive models.

Victor G. De Gruttola, SM, SM, SD; Professor of Biostatistics. Methods for analysis of repeated measures from longitudinal studies.

Gregory DiRienzo, MS, PhD; Assistant Professor of Biostatistics. Statistical methods arising in AIDS research; clinical trials.

Garrett Fitzmaurice, MSc, MA, SD; Associate Professor of Biostatistics. Likelihood and nonlikelihood approaches to analyzing multivariate binary outcomes.

Robert C. Gentleman, MSc, PhD; Associate Professor of Biostatistics. Statistical computing and the analysis of censored data.

Robert J. Gray, SM, PhD; Senior Lecturer on Biostatistics. Clinical trials; survival analysis; techniques for exploratory data analysis and model building.

David P. Harrington, AM, PhD; Professor of Biostatistics. Nonparametric methods for censored data; sequential designs for clinical trials.

Chengcheng Hu, MA, MS, PhD; Assistant Professor of Biostatistics. Failure-time data; measurement error; missing data; longitudinal data; clinical trials.

Wenzheng Huang, ME, PhD; Assistant Professor of Biostatistics. Generalized linear models and survival analysis.

Michael D. Hughes, MSc, PhD; Professor of Biostatistics. Statistical methods in the design, analysis, and reporting of clinical trials and overviews.

Joseph G. Ibrahim, MS, PhD; Associate Professor of Biostatistics. Generalized linear models; Bayesian inferences.

Hongyu Jiang, PhD; Assistant Professor of Biostatistics. Methodology for clinical trails and epidemiologic studies; multivariate survival analysis; bioinformatics.

Karen M. Kuntz, SM, SD; Associate Professor of Health Decision Science. Cost-effectiveness analysis of cancer-screening strategies.

Nan M. Laird, PhD; Professor of Biostatistics. Longitudinal studies; nonresponse and missing-data methods; discrete data analysis; Bayesian methods.

Cheng Li, PhD; Assistant Professor of Biostatistics. Computational biology; genetic network modeling.

Yi Li, MS, MS, PhD; Assistant Professor of Biostatistics. Survival analysis; longitudinal and spatial data analysis.

Donna S. Neuberg, MA, MA, SD; Lecturer on Biostatistics. Cancer clinical trials; genetic epidemiology.

Marcello Pagano, SM, PhD; Professor of Statistical Computing. Statistical computing; clinical trials; epidemic modeling.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Analytic methods for drawing causal inferences from complex observational and randomized studies.

Andrea G. Rotnitzky, MA, PhD; Senior Lecturer on Biostatistics. Longitudinal data analysis; analysis of repeated categorical data and cluster correlated data.

Louise M. Ryan, PhD; Professor of Biostatistics. Rodent tumorigenicity experiments; teratology experiments; clinical trials; goodness-of-fit tests; survival analysis.

Mei-Chiung Shih, MS, PhD; Assistant Professor of Biostatistics. Statistical genetics and genetic epidemiology; nonlinear and nonparametric regression.

Kenneth E. Stanley, MA, PhD; Lecturer on Biostatistics. Estimating mortality attributable to tobacco in the presence of incomplete information.

Marcia A. Testa, MPH, MPhil, PhD; Senior Lecturer on Biostatistics. Evaluation of quality-of-life indexes in therapeutic clinical trials.

Florin Vaida, PhD; Assistant Professor of Biostatistics. Markov chain Monte Carlo; likelihood inference; nonparametric modeling; longitudinal data.

Matthew P. Wand, PhD; Associate Professor of Biostatistics. Nonparametric curve estimation; Markov chain Monte Carlo; computational statistics.

Wei Wang, MS, PhD; Assistant Professor of Biostatistics. Survival analysis; longitudinal and functional data analysis; semiparametric modeling.

YouGan Wang, MS, PhD; Associate Professor of Biostatistics. Sequential clinical and screening trials; estimating functions and asymptotic inference.

James H. Ware, PhD; Frederick Mosteller Professor of Biostatistics and Dean for Academic Affairs. Design and analysis of longitudinal studies.

Lee-Jen Wei, PhD; Professor of Biostatistics. Design and analysis of clinical trials; repeated measurements analysis; survival analysis.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Cost-effectiveness of health practices and technologies.

Paige L. Williams, BSPH, PhD; Lecturer on Biostatistics. Cancer risk assessment and other areas of environmental statistics.

Wing Hung Wong, MS, MS, PhD; Professor of Computational Biology. Bayesian computation; high-dimensional molecular biology and genetics.

ERIC TCHETGEN

Doctoral student, Department of Biostatistics

World citizen Eric Tchetgen was born in Cameroon, spent his teenage years in France, and moved to the United States to enroll in college when he was 19. Midway through his electrical engineering program at Yale, he took two years off to travel, work, and spend time with his family.

During this time he joined an agricultural project in Ghana, exploring social and economic incentives to farmers for adopting new hybrid varieties of maize. While in Ghana, Tchetgen says, "I saw problems in basic health and health policy that seemed disconnected from empirical research. So I started reading about public health and how to integrate empirical methods into policy and that led me to the Summer Program in Biostatistics at HSPH." Tchetgen then saw how his quantitative skills and background could help in solving real health problems.

Tchetgen returned to Yale and finished his bachelor's degree with a double major in electrical engineering and applied mathematics. Then he entered the doctoral program in biostatistics. "During the one summer I had been here," he says, "I had made connections with faculty members with whom I wanted to work." Now that he is at the school full time, Tchetgen cites his relationships with faculty members as highlights of his HSPH experience. Tchetgen's research interests are causal inference and HIV/AIDS–related topics.

Ronghui (Lily) Xu, MA, PhD; Assistant Professor of Biostatistics. Survival analysis, particularly in relation to proportional hazards models; goodness of fit.

Marvin Zelen, AM, PhD; Professor of Statistical Science and Member of the Faculty of Arts and Sciences. Theory and practice of clinical trials.

Secondary Appointments

(primary appointments at Harvard Medical School or Faculty of Arts and Sciences)

Roger B. Davis, MA; Associate Professor in the Department of Biostatistics. Design and analysis of clinical trials; recursive partitioning methods.

Dianne M. Finkelstein, AM, PhD; Associate Professor in the Department of Biostatistics. Carcinogenicity experiments; survival analysis.

Kimberlee Gauvreau, SM, SD; Assistant Professor in the Department of Biostatistics. Biostatistical issues in clinical studies in pediatric cardiology; institutional variability in outcomes after congenital heart disease surgery.

Richard D. Gelber, SM, PhD; Professor in the Department of Biostatistics. Design/analysis of clinical trials.

Rebecca S. Gelman, PhD; Associate Professor in the Department of Biostatistics. Clinical trials; disease screening; survival methods.

Robert J. Glynn, MA, PhD, SM, SD; Associate Professor in the Department of Biostatistics. Analysis of longitudinal data; nonresponse in sample surveys.

Nicholas T. Lange, MS, SD; Associate Professor in the Department of Biostatistics. Statistical methodology for human and animal brain mapping.

Mei-Ling Ting Lee, MS, MA, PhD; Associate Professor in the Department of Biostatistics. Lifetime data analysis; categorical data analysis.

Jun Liu, PhD; Professor in the Department of Biostatistics. Genetics; computational biology; missing data; Bayesian methodology.

Sharon-Lise T. Normand, MSc, PhD; Associate Professor in the Department of Biostatistics. Bayesian inference; graphical models; meta-analysis.

E. John Orav, PhD; Associate Professor in the Department of Biostatistics. Statistical computing and simulation; stochastic modeling; bioassay.

Bernard A. Rosner, MA, PhD; Professor in the Department of Biostatistics. Analysis of clustered binary data; longitudinal data analysis.

David A. Schoenfeld, AM, PhD; Professor in the Department of Biostatistics. Statistics in medical research; linear models; bioassay; survival theory.

David Wypij, ScM, MS, PhD; Associate Professor in the Department of Biostatistics. Longitudinal data analysis; repeated measures and growth curve models.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Population and International Health. Biostatistical/demographic methods.

Adjunct Faculty

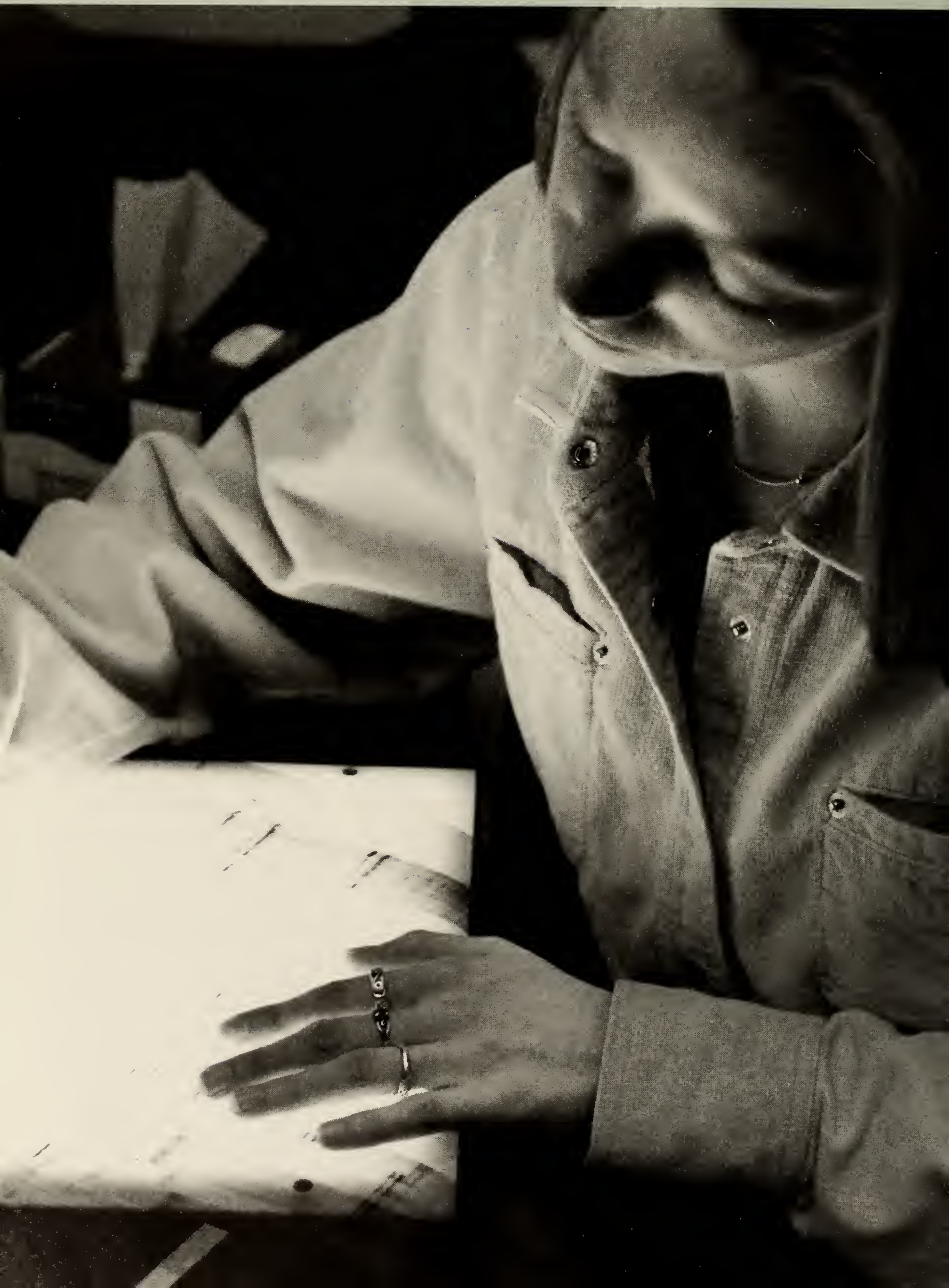
Cyrus R. Mehta, SM, PhD. Cytel Software Corporation.

DeJuran Richardson, MS, PhD. Lake Forest College.

Michael A. Stoto, PhD. Department of Epidemiology and Biostatistics, George Washington University.

Hulin Wu, MS, MS, PhD. Frontier Science and Technology Research Foundation; Statistical and Data Analysis Center, AIDS Clinical Trials Group.

Department of Cancer Cell Biology



The goal of the Department of Cancer Cell Biology is to conduct and promote research and training on the effects of radiation and environmental chemicals on the health of human beings.

The Department of Cancer Cell Biology features laboratory research that combines recent advances and techniques in biochemistry, molecular and cell biology, and genetics to focus on the mechanisms involved in the development of cancer and the means for its prevention and treatment. Specific emphases include the growth control of cancer cells; the damage and repair of DNA, particularly in response to chemicals and oxidants present in the environment; and the biological effects of low-dose radiation exposure.

The department has component divisions of cancer research in radiation biology and toxicology.

Radiation biology The research and training program in radiation biology emphasizes studies at the cellular and molecular levels in an integrated approach to the investigation of the lethal, mutagenic, and carcinogenic consequences of exposure to radiation and chemical agents and the role of genetic instability in the development of cancer. Goals include not only defining the hazardous effects of such exposures but also examining the mechanisms involved in these effects. The research encompasses both mechanistic and applied studies utilizing in vitro systems, primarily human cells in culture. A strong focus is placed on a molecular-level approach. Ongoing research uses a broad range of molecular biology and recombinant DNA techniques in the study of cell-cycle control, genomic instability, signal transduction, and genetic susceptibility to cancer.

Toxicology The research and training programs in toxicology explore the interactions of environmental agents with a variety of cellular and subcellular systems, the biochemical and molecular mechanisms of toxicity, and the health implications of environmental exposures. It is often necessary to consider and analyze the relation between chemical, biological, and social factors affecting both the nature of and response to occupational or environmental factors. The program stresses interdisciplinary approaches that join the power of modern molecular genetics and cell biology with the problems of public health. Research includes such topics as biochemical and genetic responses to oxidative stress, molecular biology of the repair of DNA damage, mutagenesis in prokaryotes and eukaryotes, genetic recombination and predictive carcinogenesis, and molecular mechanisms of genetic instability in cancer and aging.

Degree Programs in Cancer Cell Biology

As described below, two degree programs are available in cancer cell biology: the doctor of science (SD), offered by the Department of Cancer Cell Biology, and the doctor of philosophy (PhD), offered through the Division of Biological Sciences. No master of science programs are currently available.

Doctor of Science in Cancer Cell Biology

The SD program provides training in cancer research, emphasizing toxicology and radiobiology. The program focuses on genetic susceptibility to the effects of environmental carcinogens, as well as on a molecular epidemiologic approach to tumor biology. The program aims to develop basic skills in laboratory techniques and data handling necessary for original research. Graduates of the program pursue careers as researchers and faculty members in academic institutions and as scientists in private industry and government.

The objectives of the program are satisfied through the combined experience of course work and laboratory-based investigation. General course work covers molecular biology, genetics, biochemistry, physiology, and cell biology. Students receive additional training in toxicology, radiobiology, or molecular epidemiology and also have opportunities to participate in translational collaborative research with hospitals and medical

ANASTASIA KOUTSOLIOUTSOU

Doctoral student, Department of Cancer Cell Biology

After earning a bachelor of science degree in chemistry from MIT, Anastasia Koutsolioutsou began her education at HSPH by earning a master's degree in environmental health. She decided to stay on for her doctorate because she wanted to conduct research in environmental microbiology. She says, "I wanted to study how environmental conditions can affect the growth of pathogens," like cholera bacteria. More specifically she wanted to look at the molecular responses of microorganisms to changes in various environmental parameters and the effect of these changes on pathogen survival in the environment.

Koutsolioutsou rotated through a number of HSPH laboratories affiliated with various academic departments before deciding that a cancer cell biology lab best suited her. She now spends her days investigating the responses of bacteria to reactive oxygen species and reactive nitrogen species, both of which are major antibacterial weapons of the immune system. "I'm also trying to understand the defenses that bacteria have to antibiotics," she adds. "In our lab we have been studying a group of genes that play a role both in protection from reactive oxygen and nitrogen species and in antibiotic resistance."

After completing her doctorate, Koutsolioutsou would like to continue her microbiologic research, possibly as a postdoctoral research fellow. She also hopes to get involved in bioethics and policy-making on the use of scientific information.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.harvard.edu/registrar/courses.

Principles of Toxicology

Introduction to Cancer Biology

Cell Response to Mutagens and Carcinogens

Biomarkers in Cancer Research

Independent Study, Field Experience

schools in the area. Laboratory-based work includes development of hypotheses, experimental design for testing these, confirmation and interpretation of results, and presentation. SD students have the opportunity to rotate within the laboratories in the department to further develop their interest in either radiobiology or toxicology. Each student is matched with a faculty adviser whose research interests are relevant to the thesis topic. Other resources available to students include seminars, workshops, and informal discussion groups at HSPH, Harvard Medical School, and surrounding research laboratories and hospitals.

Applicants to the SD program should have completed course work in the biological sciences and hold a bachelor's degree in a relevant field. Students must fulfill the course requirements for a major in cancer cell biology. Please contact the department for more information about this program. For more information about schoolwide requirements for doctoral degrees, see page 59.

Financial aid for cancer cell biology may be available to SD students who are U.S. citizens or permanent residents through NIH-sponsored training grants.

Doctor of Philosophy in Biological Sciences in Public Health (Cancer Cell Biology)

Students wishing to study radiation biology or toxicology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants are required to take both the GRE general and subject tests; these must be taken in time to meet the application deadline of December 16, 2002. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The PhD program is designed to offer a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in the program engage in laboratory rotations in three different research areas to enable them to assess realistically their interests in a thesis project and to evaluate the suitability of the laboratory and mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended successfully before the granting of the PhD.

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

RELATED OFFERINGS

Interdisciplinary concentration in molecular epidemiology, see page 57.

CONTACT INFORMATION

For more information about research and training in cancer cell biology, please contact Pamela Quattrocchi, Department of Cancer Cell Biology, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0977
Fax: 617-432-0107
E-mail: pquattro@hsph.harvard.edu

For the PhD program on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web:http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4470
Fax: 617-432-4033
E-mail: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/bph/

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair (acting): Bruce Demple, PhD; Professor of Toxicology. Repair enzymes for oxidative DNA damage; molecular biology of cellular responses to oxidative stress.

Karl T. Kelsey, MD, MOH; Professor of Cancer Biology and Environmental Health. Occupational and environmental carcinogenesis, including molecular epidemiologic studies of the determinants of somatic genetic changes in cancer; cancer susceptibility.

Carl G. Maki, PhD; Assistant Professor of Radiobiology. Cancer biology; radiation research; DNA repair; cell-cycle regulation.

Dieter Wolf, MD; Assistant Professor of Toxicology. Maintenance of normal genome copy through replication control and genetic identification of conserved components; role of proteolysis in replication control.

Zhi-Min Yuan, MD, PhD; Assistant Professor of Radiobiology. Cancer biology; radiation research; cell-cycle regulation; signaling pathways.

Secondary Appointments

(primary appointment at Harvard Medical School)

Howard L. Liber, PhD; Associate Professor in the Department of Cancer Cell Biology. Development and utilization of cellular and molecular methods to investigate mutagenesis in human cells, from both mechanistic and environmental perspectives.

Adjunct Faculty

Peter Ofner, MRSC, PhD. Department of Pharmacology and Experimental Therapeutics, Tufts University School of Medicine.

Leona D. Samson, PhD. Department of Bioengineering and Environmental Health, MIT.

Department of Environmental Health

The mission of the Department of Environmental Health is to advance the health of all people in occupational and community settings in the United States and around the world through research and training in environmental health.

Faculty members in the department study the pathogenesis and prevention of environmentally produced illnesses and act as catalysts for scientifically based public health advances. Research approaches range from the molecular to the epidemiologic.

The Department of Environmental Health focuses on complex problems that require the contributions of many specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include chemists, engineers, epidemiologists, applied mathematicians, physicians, occupational health nurses, physiologists, cell biologists, molecular biologists, and microbiologists. Teaching and research activities of the department are carried out through five concentrations: environmental epidemiology, environmental science and engineering, occupational health, physiology, and population genetics, as well as a number of areas of interest.

ENVIRONMENTAL EPIDEMIOLOGY

Environmental epidemiology focuses on identifying and measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies. The research program integrates epidemiologic methods, physiologic assessment of health, and advanced analytic methods to assess environmental health risks. Problems being investigated include the cognitive and cardiovascular effects of lead, the effects of air pollution on respiratory and cardiovascular health, the effects of infectious agents and disinfection byproducts in drinking water, biomarkers of environmental exposure, and genetic susceptibility to environmentally induced malignancies. Within the concentration a number of areas of interest are offered, including asthma, cancer, cardiovascular disease, chronic respiratory disease, heavy metals, indoor and outdoor air pollution, and radiation.

Degree Programs in Environmental Epidemiology

As described below, the environmental epidemiology concentration offers both 80-credit and 40-credit master of science (SM) programs in environmental health, as well as a program leading to the doctor of science (SD) degree. For information about schoolwide requirements for master's and doctoral degrees, see page 59.

Master of Science in Environmental Health (80-credit and 40-credit programs)

The master's programs in environmental epidemiology provide students with basic skills in environmental exposure assessment and epidemiologic methods, in preparation for entry into a doctoral program or for a career in public or environmental health research or policy. Recent graduates are working in academic research, public agencies, environmental advocacy groups, and environmental consulting companies.

The 80-credit SM program is designed for individuals who hold a bachelor's degree and have strong quantitative skills. The 40-credit program is open to applicants with a medical degree or a master's degree in a related scientific discipline, as well as strong quantitative skills.

Required courses for both programs include principles of biostatistics, introduction to epidemiology and elements of epidemiologic research, design and analysis of case-control and cohort studies, human physiology, environmental and occupational epidemiology, and the analysis of rates and proportions.

For the 40-credit program the remainder of courses reflect areas of interest specific to the students. Students may enroll in the 40-credit program on a part-time basis, completing it over two years. In the 80-credit program students are encouraged to participate in research seminars within the environmental epidemiology concentration and affiliated groups.

Doctor of Science in Environmental Health

Graduates of the SD program are prepared for careers in educational institutions, in government agencies, and as private consultants. Recent graduates are working for the U.S. Environmental Protection Agency (EPA), Health Canada, and schools of public health. Students interested in a research career are encouraged to apply to the doctoral program in epidemiology with a minor in environmental health; candidates in this program must meet all of the requirements of the Department of Epidemiology.

Applicants to the SD program in environmental epidemiology should have a master's degree in environmental health, epidemiology, or biostatistics, as well as strong quantitative skills. Candidates must fulfill the course requirements for a major in environmental health (20 credits), plus a minor in epidemiology (10 credits) and one other field (10 credits).

Financial support for environmental epidemiology doctoral students may be available to U.S. citizens and permanent residents through NIH-sponsored training grants.

RELATED OFFERINGS

Environmental/occupational epidemiology area of interest, Department of Epidemiology, see page 21.

CONTACT INFORMATION

For more information about research and training in environmental epidemiology, please contact Douglas W. Dockery, SD, Department of Environmental Health, HSPH Landmark Center, Suite 415, 401 Park Drive West, Boston, MA 02115.
Phone: 617-384-8741
Fax: 617-384-8745
E-mail: ddockery@hsph.harvard.edu

ENVIRONMENTAL SCIENCE AND ENGINEERING

The concentration in environmental science and engineering emphasizes the chemical, physical, microbiological, engineering, and risk-assessment aspects of environmental and occupational exposures. Faculty members measure and model ambient, indoor, and personal exposures to environmental and work-

place contaminants; develop instruments and methods for collecting, analyzing, and assessing the effects of physical, chemical, and biological factors; and conduct risk evaluations of new products, fuels, water supplies, technologies, and remediation strategies. Collaborative teaching and research are conducted in many countries, including Mexico, Chile, China, Colombia, Greece, Russia, Argentina, Taiwan, Japan, and the Netherlands.

Students specialize in one of the following six areas of interest: environmental health management, for midcareer professionals with interests in the connections between environmental science and developing countries; environmental health sciences, for those wishing to identify and characterize human and ecological exposures to environmental contaminants; environmental science and risk management, which provides students with an integrated education in environmental science, risk analysis, and decision making; ergonomics and safety, providing a public health and engineering approach to the prevention of work-related injuries; industrial hygiene, which offers training in the anticipation, identification, evaluation, and control of occupational hazards; and water pollution, for those seeking in-depth training in water quality issues.

Degree Programs in Environmental Science and Engineering

As described below, the environmental science and engineering concentration offers both 80-credit and 40-credit master of science (SM) programs in environmental health, as well as a program leading to the doctor of science (SD) degree.

Students take core courses in human physiology, analytical chemistry and exposure assessment, air pollution, environmental and occupational epidemiology, risk assessment, regulatory toxicology, introductory statistical methods, and introductory epidemiology. Advanced courses in environmental science are oriented toward a specific pollutant or medium (such as air, surface water, or groundwater). They may focus on monitoring, modeling, or the control of the pollutants; or they may emphasize resources and occupational management, regulation, and policy.

In addition to the general core requirements, areas of interest have specific course requirements. Students in the environmental science and risk management area are expected to complete a practicum. Many students also take courses at MIT and at other Harvard schools, including the Kennedy School of Government and the Faculty of Arts and Sciences. For information about schoolwide requirements for master's and doctoral degrees, see page 59.

Master of Science in Environmental Health (80-credit and 40-credit programs)

Graduates of these professional programs assume positions in government, in private companies, or in research institutions. In the past few years some graduates have gone to work as industrial hygienists with biotech firms, consulting companies, and the military. Some are working for nonprofit community and international organizations, while others have gone on to pursue doctoral programs. In the environmental science and risk management area, graduates may pursue careers utilizing decision analysis skills in program design, management, and policy.

Applicants' personal statements should clearly state their preferred area of interest and the ways that the program will further their careers.

Applicants to the 80-credit program generally have undergraduate degrees and limited work experience. Consistent with the interdisciplinary nature of the concentration, a broad range of undergraduate or graduate degrees are acceptable. Among these are environmental science, physics, mathematics, biology, chemistry, engineering, geology, meteorology, and decision analysis. Occasionally applicants with social science, business, or policy backgrounds are successful if they can demonstrate some academic background in math, chemistry, and biology. At times applicants are accepted conditional upon completing science and/or math courses.

Applicants with exceptional credentials (including postbaccalaureate degrees and professional experience) may request consideration for admission to a 40-credit SM program in the areas of environmental health sciences or industrial hygiene.

Doctor of Science in Environmental Health

Doctoral graduates are qualified for research and teaching positions in schools of public health and other academic institutions, in local and federal agencies, and in the private sector. Recent graduates have taken positions as junior faculty members; as research scientists with the EPA, the National Institute for Occupational Safety and Health (NIOSH), and Health Canada; and as staff scientists with the National Research Council, the Mexican Ministry of Health, and consulting organizations.

Applicants to the doctoral program normally have a master's degree in environmental science or a related field and strong scientific and quantitative skills. Those applying to study in environmental science and risk management and in industrial hygiene usually have several years of relevant work experience in addition to a master's degree. Admission into the doctoral program in all areas of interest depends upon demonstrated competence in the requirements for an SM program described above.

Students undertake a comprehensive program in their specialty area. In addition to the schoolwide requirements, doctoral candidates must serve as a teaching assistant for the equivalent of three 5-credit courses. During the course of their program, most doctoral students also take advantage of opportunities to present papers at scientific conferences.

Depending on the specialty area, doctoral students may be funded either fully or partially through research fellowships or training grant fellowships. NIH traineeships are restricted to support for doctoral students who are U.S. citizens or permanent residents. For students specializing in industrial hygiene, tuition support may be available through a NIOSH Education and Research Center Grant for highly qualified U.S. citizens or permanent residents. Students may also apply for a fellowship offered directly by the Oak Ridge Institute for Science and Education of the Department of Energy; please consult http://www.orau.org.

CONTACT INFORMATION

For more information about research and training in environmental science and engineering, please contact the Environmental Science and Engineering Program, HSPH Landmark Center, Box 15677, 401 Park Drive West, Boston, MA 02115.

Applicants to the doctoral program are strongly encouraged to arrange an interview with faculty members. Please contact Linda A. Fox, administrator, Environmental Science and Engineering Program, at the address above.

YING ZHOU

Doctoral student, Departments of Environmental Health and Health Policy and Management

After earning her bachelor's degree from Tsinghua University in China with a dual major in environmental engineering and computer science, Ying Zhou worked for a year as an environmental consultant. She assessed the pollution status of a wide range of industrial facilities in China. "It was interesting work, interviewing people, collecting information, doing visual inspections, and maybe taking soil or water samples," says Zhou, "but I wanted to do more in-depth research, particularly in the field of environmental health risk assessment. And that meant going back to school."

Zhou was happy to find an academic home at HSPH with training in environmental science and risk assessment. "Not only have I learned more about the health effects of environmental pollution, but I've also learned economics, decision analysis, and statistics and integrated them into my research," she says.

Zhou is in the final stages of researching and writing her thesis. She is estimating the health damage caused by air pollutants emitted from power plants in China. Following graduation she would like to work for an international nongovernmental organization or as a consultant.

Phone: 617-384-8821
Fax: 671-384-8728
E-mail: lfox@hsph.harvard.edu

OCCUPATIONAL HEALTH

This concentration is designed to train occupational safety and health professionals to recognize and prevent occupational disease and injuries. Faculty members carry out research spanning a wide range of occupational health problems, with the broad objective of identifying and contributing to the reduction or elimination of job-related health hazards. Research topics include respiratory disease among exposed populations (including construction, auto, textile, and agricultural workers, workers exposed to fuel-oil ash, and building occupants); reproductive and chronic disease studies of populations exposed to petrochemicals, heavy metals, and persistent organic compounds; biological and chemical hazards assessment; epidemiology of acute injury and cumulative trauma disorders; occupational and environmental cancers such as lung, skin, and bladder cancer; biomonitoring and medical surveillance; worker training; occupational health research and training in developing countries; and occupational health policy and services research. Faculty members have been in the forefront of the development of biochemical, molecular, and genetic markers and their applications in epidemiologic studies of exposed populations. Additional areas of interest within this concentration include environmental molecular epidemiology and occupational epidemiology.

Degree Programs in Occupational Health

The training programs in occupational health are offered through the NIOSH-sponsored Harvard Education and Research Center for Occupational Safety and Health. As described below, the following programs are offered: master of occupational health (MOH); master of science (SM) in primary health care nursing (from Simmons College) and dual-degree SM in environmental health and primary health care nursing (from HSPH, in cooperation with Simmons College); SM in environmental health with a focus on occupational safety and health; and doctor of science (SD) or doctor of public health (DPH). For information about schoolwide requirements for master's and doctoral degrees, see page 59.

Master of Occupational Health (40-credit program)

This professional program is designed to train physicians in the public health disciplines relevant to the prevention and control of occupational disease and injury. Physicians interested in occupational and environmental medicine may apply either to the MOH program or to the occupational and environmental health concentration of the master of public health (MPH) program. Either the MOH or the MPH is taken as the first year of a two-year Occupational and Environmental Medicine Residency (see below).

For the MOH (or the MPH) program students take core courses in the principles of biostatistics, epidemiology, and toxicology; ergonomics and human factors; occupational safety; occupational health policy and administration; the work environment; society and health; occupational and environmental medicine; environmental and occupational epidemiology; and the practice of occupational health. Recommended electives cover the analysis of rates and proportions, regression and analysis of variance in experimental research, and the ethical basis of the practice of public health.

Master of Science in Environmental Health (80-credit and 40-credit programs)

The occupational health concentration emphasizes the epidemiologic and biostatistical aspects of this field. The SM is normally an 80-credit program, although an individual with a PhD or JD may be admitted to a 40-credit program. It is generally expected that students without a prior doctoral degree will wish to enroll in a subsequent doctoral program.

This professional program has broad applicability and provides training appropriate for those who wish to work in local, state, or federal government departments or agencies; in research or teaching environments; in environmental management firms; and as private consultants.

Applicants normally have a bachelor's degree and advanced training in science, including college-level organic and inorganic chemistry. Those currently holding positions in the field of occupational safety and health and planning to return to these positions are considered particularly strong candidates for admission.

Master of Science in Primary Health Care Nursing (40-credit program)

This program is offered by the Harvard Education and Research Center and Simmons College, which awards the degree. The program is designed for registered nurses seeking preparation as occupational health nurse practitioners.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of basic statistics and physical assessment courses, and must be registered to practice nursing in a U.S. state or territory.

Participants undertake practica in industrial settings, clinics, and hospital-based occupational health programs and complete a course at HSPH in occupational health policy and administration and courses at Simmons College in normal and abnormal human physiology, research methods, the theory and practice of primary health care nursing, the theoretical foundations for nursing practice, clinical pharmacology for nurses in ambulatory care, health in the workplace, health care systems, and health promotion.

Master of Science in Environmental Health (HSPH) and Primary Health Care Nursing (Simmons College) (dual-degree, 80-credit program)

This dual-degree professional program emphasizes identification of health hazards, workplace assessment, program planning and intervention, worker health promotion, and disease and injury prevention. The program integrates curricula from HSPH and Simmons College, with courses taken concurrently at these institutions.

The program focusing on occupational health nursing is also aimed at preparing nurses for positions as occupational health nurse practitioners. Practice locations include workplaces/corporations, clinics (including occupational and environmental medicine facilities), and hospitals.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of a basic statistics course, and must be registered to practice nursing in a U.S. state or territory. Nurses interested in this program must apply to, be accepted by, and maintain satisfactory academic progress in both schools.

Students in the dual-degree program fulfill essentially the same course requirements as those enrolled in the 40-credit program. In addition, they must take courses covering ergonomics and human factors, the work environment, occupational safety, the principles of biostatistics and epidemiology, and environmental and occupational epidemiology; a tutorial in toxicology; and two electives. Students must also complete an independent study project.

Doctor of Science in Environmental Health/Doctor of Public Health

The SD or DPH degree may be earned by students who wish to concentrate in occupational health. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

Some financial support may be available for doctoral students who are U.S. citizens or permanent residents through National Research Service Awards, NIOSH or other traineeships, or scholarships.

Occupational and Environmental Medicine Residency

The residency is a two-year program consisting of an academic year leading to the master of public health or master of occupational health degree and a practicum year devoted to the development of skills in clinical occupational and environmental medicine and epidemiologic research. During the practicum year acquired knowledge and skills are applied to patient management and workplace community problem solving; at least one short-term research project is designed, executed, and documented under faculty supervision. Field experience includes rotations through hospital- and community-based occupational and environmental health clinics. Additional rotation choices are available in corporate medical departments and governmental agencies. The residency is fully accredited by the Accreditation Council for Graduate Medical Education.

Applicants must be graduates of an approved school of medicine and must have completed at least one year of internship training in an accredited U.S. or Canadian clinical program; board eligibility or certification in a primary care specialty is preferred. Physicians currently holding positions in the field of occupational safety and health who plan to return to these positions are considered strong candidates for admission.

In addition to submitting an application to the degree program, prospective residents should send a letter of interest to the Occupational Health Program, enclosing a curriculum vitae listing medical training and experience, research experience, and publications. Admission to the practicum year of the residency is

a separate process from, and usually occurs shortly after, admission to the degree program. Applicants to the MOH program and the MPH program with a concentration in occupational and environmental health who are also applying to the Occupational and Environmental Medicine Residency program must apply by September 1, 2002, for 2003–04 matriculation. Continuation into the second year of the residency is contingent upon having had adequate prior clinical experience and exemplary performance in the didactic phase of the program.

Some financial support for residency candidates who are U.S. citizens or permanent residents may be available through traineeships.

RELATED OFFERINGS

Environmental/occupational epidemiology area of interest, Department of Epidemiology, see page 21.

MPH concentration in occupational and environmental health, see page 55.

CONTACT INFORMATION

For more information about the occupational health concentration, MOH program, training in occupational epidemiology, and related offerings, please contact David C. Christiani, MD, MPH, SM, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1260
Fax: 617-432-3441
E-mail: dchris@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/erc

For more information about the Occupational and Environmental Medicine Residency, please contact Howard Hu, MD, SM, SD, Department of Environmental Health, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2790
Fax: 617-432-0219
E-mail: howard.hu@channing.harvard.edu
Web: http://www.hsph.harvard.edu/erc

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Introduction to Environmental Health
Principles of Environmental Health
Human Physiology
Environmental and Occupational Epidemiology
Advanced Respiratory Physiology
Advanced Topics in Physiology
Occupational Health Policy and Administration
Introduction to Occupational and Environmental Medicine
Epidemiologic Basis of Occupational Health Standards
Occupational Safety and Injury Prevention
Ergonomics and Human Factors
Protecting Workers from Hazardous Substances
Ventilation and Indoor Air Quality
Control of Noise and Vibration in the Workplace
Introduction to Aerobiology
Water Pollution
Properties of Environmental Contaminants
Introduction to the Work Environment
Analytical Methodology and Exposure Assessment
Water Systems Management
Industrial Hygiene/Ergonomics Internship and Environmental Sciences Research Seminar
Respiratory Epidemiology
Exposure Assessment for Environmental and Occupational Epidemiology
Strategies for Environmental Management
Advanced Regression for Environmental Epidemiology
Modern Genetic Epidemiology and Gene-Mapping
Human Health and Global Environmental Change
Radiation Environment: Identification, Evaluation, and Control
Research in Physiology
Properties and Behavior of Airborne Particles
Air Pollution: Atmospheric Processes, Modeling, and Energy
Risk Assessment
Regulatory Toxicology
Environmental Science and Risk Management
Industrial Ecology and Life-Cycle Assessment
Advanced Seminar in Aerobiology
Independent Research, Field Experience

PHYSIOLOGY

The program in physiology focuses on normal and pathological functions of organisms. It centers on the respiratory system, which presents an immense thin-surface area to the environment, and thus is an important route of entry and site of damage from toxins and infections. Areas of research include biomechanical properties of cells/tissue in normal/inflamed lungs; smooth muscle and airway constriction in asthma; mediators and adhesion molecules involved in pulmonary inflammation; effects of inhaled particles; lung infections; control of breathing in humans; sleep-related breathing disorders; respiratory sensations; and epithelial cell, macrophage, lymphocyte, and neutrophil lung biology. The biology is broadly based, ranging from molecular and cell biology to integrated organismic, environmental, and comparative physiology.

The physiology program integrates a range of scientific disciplines, including physics, bioengineering, physiology, biomathematics, cell biology, molecular biology, clinical science, and epidemiology. By working within this rich interdisciplinary environment, students learn many measurement technologies, discover a variety of disciplinary approaches, and develop mature scientific thinking. Special facilities, including a confocal microscope, analytical electron microscopes, a flow cytometer, a sleep laboratory, and a sensation laboratory, are available.

Degree Programs in Physiology

As described below, the concentration in physiology leads either to the doctor of science (SD) degree, offered through the Department of Environmental Health, or the doctor of philosophy (PhD) degree, offered through the Division of Biological Sciences.

Doctor of Science in Environmental Health

Students wishing to study cellular, integrative, or engineering approaches as they pertain to problems in the environment, physiology, or public health may apply directly to the SD program in the Department of Environmental Health.

The SD program prepares students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Students in this program follow a different curriculum from those in the PhD program. The program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics, and provides the opportunity for students to engage in laboratory rotations. For information about schoolwide requirements for doctoral degrees, see page 59.

Most students admitted to the SD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships

from outside sources since certain external fellowships provide higher stipends.

Doctor of Philosophy in Biological Sciences in Public Health (Physiology)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health may apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

The PhD program is designed to prepare students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. Graduates ordinarily assume positions as faculty members and research scientists at medical schools, research institutes, and schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

As for the SD program, applicants to the PhD program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants must take both the GRE general and subject tests in time to meet the PhD application deadline of December 16, 2002. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The PhD program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in this program engage in laboratory rotations in three different research areas to enable them to assess realistically their interests in a thesis project and to evaluate the suitability of the laboratory and the mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended before the granting of the PhD.

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority PhD students in the sciences.

CONTACT INFORMATION

For more information about research and training in physiology or about the SD program, please contact Jeffrey J. Fredberg, PhD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0198
Fax: 617-432-3468
E-mail: jfredber@hsph.harvard.edu

For the PhD program on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4470
Fax: 617-432-4033
E-mail: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/bph

POPULATION GENETICS

The aim of the population genetics concentration is to consider the effects of genes, environmental risk factors, and the interaction of the two in the process for genetically complex diseases such as asthma, osteoporosis, diabetes, hypertension, nicotine addiction, and reproductive health.

Population genetics is a multidisciplinary field, combining various aspects of genetics, epidemiology, statistics, biology, medicine, and computer science; those who work in this field have equally diverse backgrounds. The concentration in population genetics is intended to provide candidates with ample training in all critical areas needed to carry on independent research in this field, including gene-mapping to identify the genetic loci and variants responsible for the genetic contribution to complex diseases; gene assessment to investigate the role of a particular (candidate) gene in disease pathogenesis; mutation detection and determination of allele frequency distribution to investigate the distribution of factors in the population at large that predispose persons to disease; gene expression profiling to investigate the genes with differential expression in normal and disease tissues and in subtypes of diseases; analysis of gene-environmental interactions to investigate the relative contributions of genetic and environmental factors in disease manifestation; development of novel statistical methods and tools for genetic analysis; and development of databases and bioinformatics tools for data management and information extraction from public databases.

The Program for Population Genetics (PPG) is presently engaged in several large-scale studies of common, genetically complex human diseases. In addition, PPG investigators collaborate closely on related studies with the Occupational Health Program, Environmental Epidemiology Program, and other programs in the Departments of Environmental Health, Epidemiology, Biostatistics, and Nutrition.

Degree Programs in Population Genetics

As described below, the concentration offers a doctor of science (SD) program. No master's degree programs are currently available.

Doctor of Science in Environmental Health

While the program aims to prepare every student for an academic career in research and teaching, graduates are well prepared for a variety of potential career paths. Opportunities for research careers in the private sector (for example, biotech and genetics/genomics companies) have increased greatly in recent years. Graduates have also found themselves to be highly sought by management consulting firms and other organizations requiring strong technical backgrounds and problem-solving skills.

Applicants to the SD program are required to have an undergraduate degree in any area of the natural sciences, and some research experience is desirable. Students from any branch of the life sciences are the most logical candidates, but the statistical foundations of population genetics make applicants with degrees in mathematics, physics, or chemistry highly competitive. Some familiarity with basic concepts of biology and genetics is recommended; the necessary fundamen-

tals of biology, genetics, biochemistry, epidemiology, and medicine can be acquired through course work following acceptance. Highly motivated applicants from nonscientific fields may be accepted in exceptional circumstances.

In addition to the schoolwide requirements, doctoral students must complete 30 credits emphasizing population genetics, including introductory epidemiology, elements of epidemiologic research, the design and analysis of case-control and cohort studies, the molecular epidemiology of cancer, studies in molecular epidemiology, human physiology, environmental and occupational epidemiology, exposure assessment for environmental and occupational epidemiology, modern genetic epidemiology and gene-mapping, the genetic basis of human disease, and molecular biology for epidemiologists. Students take an additional 10 credits from a list of electives. For information on schoolwide requirements for doctoral degrees, see page 59.

Some financial support for doctoral students may be available to U.S citizens and permanent residents.

CONTACT INFORMATION

For more information about research and training in population genetics, please contact Xiping Xu, MD, PhD, SM, Department of Environmental Health, Program for Population Genetics, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2959
Fax: 617-432-2956
E-mail: xu@hsph.harvard.edu

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Joseph D. Brain, SM, SM, SD; Cecil K. and Philip Drinker Professor of Environmental Physiology. Function and structure of pulmonary macrophages; deposition and clearance of inhaled particles and responses to them; respiratory infection.

Deborah H. Bennett, MS, PhD; Assistant Professor of Environmental Health and Risk Assessment. Fate and transport of persistent organic chemicals in a multimedia environment as related to environmental risk analysis.

Harriet A. Burge, MA, PhD; Associate Professor of Environmental Microbiology. Aerobiology; bioaerosols in indoor air; fungus allergen ecology, characterization, prevalence, and health effects.

James P. Butler, AM, PhD; Senior Lecturer on Physiology. Lung structure and function; parenchymal micromechanics; magnetic twisting cytometry; nemoendocrinology; avian physiology.

David C. Christiani, MD, SM, MPH; Professor of Occupational Medicine and Epidemiology. Occupational diseases; biomarkers and molecular epidemiology.

Jack T. Dennerlein, SM, PhD; Assistant Professor of Ergonomics and Safety. Work-related chronic musculoskeletal disorders; design of human-machine interfaces.

Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

John S. Evans, SM, SM, SD; Senior Lecturer on Environmental Science. Assessment of human exposures to pollutants; evaluation of uncertainty; application of decision analysis; assessment of health risk from waste disposal and energy production.

Jeffrey J. Fredberg, SMME, ME, PhD; Professor of Bioengineering and Physiology. Identification of the mechanical basis of airway and lung parenchymal function at the levels of organ, tissue, cell, and protein.

Beatriz S. González-Flecha, MS, PhD; Assistant Professor of Molecular Biology and Environmental Health. Biochemistry of oxygen free radicals; oxidative stress in biological systems; mechanisms of oxidative damage in eukaryotic and prokaryotic cells.

Joseph J. Harrington, AM, PhD; Professor of Environmental Health Engineering. Water resources planning and quality management; environmental monitoring and control systems; applied statistics for modeling; management for tropical disease control.

Russ B. Hauser, MD, MPH, SD; Assistant Professor of Occupational Health. Occupational lung diseases; environmental agents and allergic airways disease; male reproductive epidemiology.

Robert F. Herrick, MS, SD; Senior Lecturer on Industrial Hygiene. Exposure-reactive aerosols; characterization of complex exposures; interaction of individuals with a source of exposure.

Howard Hu, MD, MPH, SM, SD; Associate Professor of Occupational Medicine. Epidemiology of chronic lead toxicity using biomarkers of bone lead accumulation and genetic susceptibility.

Karl T. Kelsey, MD, MOH; Professor of Cancer Biology and Environmental Health. Occupational and environmental carcinogenesis, with emphasis on the study of workplace mutagen and carcinogen exposure.

Petros Koutrakis, MS, PhD; Professor of Environmental Sciences. Sampling and analysis of air pollutants; atmospheric, indoor air, and aerosol chemistry; application of multivariate techniques to source apportionment; acid rain; urban air pollution.

Jonathan I. Levy, SD; Assistant Professor of Environmental Health and Risk Assessment. Health effects of air pollution; public health benefits of energy conservation; methods for assessing environmental risks in developing countries.

Nancy C. Long Sieber, PhD. Lecturer on Physiology. Mechanisms of pulmonary inflammation, particularly interactions between lung infection and air pollution; transport of heavy metals from respiratory and gastrointestinal tracts.

Donald K. Milton, MD, MPH, DPH; Lecturer on Occupational and Environmental Health. Measurement of airborne endotoxin; epidemiology of acute and chronic responses to bioaerosol exposure.

Joseph P. Mizgerd, SD; Mark and Catherine Winkler Assistant Professor of Physiology and Cell Biology. Physiology of inflammation, particularly the molecular mechanisms regulating the emigration of neutrophils.

Richard R. Monson, MD, SM, SD; Professor of Epidemiology and Associate Dean for Professional Education. Relationship between the workplace, the environment, and disease.

Heather H. Nelson, MPH, PhD; Assistant Professor of Environmental Epidemiology. Cancer susceptibility and etiology, with particular emphasis on gene-environment interaction and the genetic epidemiology of somatically acquired changes in malignant disease.

Stephen N. Rudnick, MS, SM, SD; Lecturer on Industrial Hygiene Engineering. Engineering control of particulate air contaminants in indoor and occupational settings and engineering control systems; sampling and analysis of air contaminants.

Joel D. Schwartz, PhD; Associate Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods.

Mark Seielstad, PhD; Assistant Professor of Population Genetics. Human population genetics and evolution; gene-mapping; genetic variants altering susceptibility or resistance to infectious disease.

Jacob Shapiro, SM, PhD; Lecturer on Biophysics. Occupational and environmental radiation protection; low-level radioactive waste disposal; radiation dosimetry and protection standards; environmental radiation surveillance.

James P. Shine, PhD; Assistant Professor of Aquatic Chemistry. Distribution, fate, and effects of contaminants in aquatic ecosystems; influence of environmental variables on routes of exposure to toxic substances.

Stephanie A. Shore, PhD; Senior Lecturer on Physiology. Airway physiology and pharmacology; role of neuropeptides in the pathogenesis of airway disease.

Thomas J. Smith, MPH, MS, PhD; Professor of Industrial Hygiene. Evaluation of exposure-response relationships through occupational epidemiologic studies; application of pharmacokinetic modeling to exposure-tissue dose relationships.

Stover H. Snook, AM, PhD; Lecturer on Ergonomics. Low-back pain; manual materials handling; heat stress; fatigue; stairway design; personal protective equipment; cumulative trauma disorders.

Frank E. Speizer, MD; Professor of Environmental Science. Environmental epidemiology; pulmonary diseases; cancer and nutrition; health effects of air pollution; occupational and environmental medicine.

John D. Spengler, PhD, SM; Akira Yamaguchi Professor of Environmental Health and Human Habitation. Assessment of human exposures to environmental contaminants; use of advanced particle analysis techniques to identify source contributions to indoor and ambient aerosols.

Helen H. Suh, SM, SD; Assistant Professor of Environmental Chemistry and Exposure Assessment. Multimedia exposure assessment; exposure modeling; ambient and indoor air pollution; study design.

Ning Wang, MS, SD; Associate Professor of Physiology and Cell Biology. Cytoskeletal mechanics; mechanochemical signal transduction; cell adhesion and migration; cancer metastasis; effects of mechanical forces on cells.

Xin Xu, MD, PhD; Assistant Professor of Population Genetics. Genetic epidemiology of complex traits in humans, with specific reference to asthma and hypertension; statistical methods and tools; bioinformatics.

Xiping Xu, MD, PhD, SM; Associate Professor of Occupational Epidemiology. Environmental, occupational, and genetic epidemiology of respiratory, cardiovascular, and metabolic diseases.

Secondary Appointments

(primary appointments at Harvard Medical School)

Robert B. Banzett, PhD; Associate Professor in the Department of Environmental Health. Respiratory neurophysiology and mechanics; perceived sensation; control; interaction with locomotion; fluid dynamics in the avian lung.

Jeffrey M. Drazen, MD; Professor in the Department of Environmental Health. Pulmonary and respiratory pharmacology; mediators of immediate hypersensitivity; mucus regulation and expression in chronic bronchitis.

John J. Godleski, MD; Associate Professor in the Department of Environmental Health. Experimental models of normal and pathologic responses to inhaled particles.

Diane R. Gold, MD, MPH; Assistant Professor in the Department of Environmental Health. Acute lower respiratory illness in childhood as a predictor of lung function and chronic respiratory symptoms; air pollution and childhood respiratory morbidity.

Rose H. Goldman, MD, MPH, SM; Associate Professor in the Department of Environmental Health. Occupational health in the biotechnology industry; metal poisoning; neurotoxicity; cumulative trauma injuries.

Stefanos N. Kales, MD, MPH; Assistant Professor in the Department of Environmental Health. Occupational and environmental lung disease; occupational/ environmental toxicology.

Jeffrey N. Katz, SM, MD; Associate Professor in the Department of Environmental Health. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper extremity disorders.

Lester Kobzik, MD; Associate Professor in the Department of Environmental Health. Lung macrophage phagocytosis and response to inhaled particles; pulmonary inflammation and pathology.

Stephen H. Loring, BMS, MD; Associate Professor in the Department of Environmental Health. Chest wall mechanics, hyperinflation, and lung transplantation; mechanics and physiology of respiratory muscles and the pleural space.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycobacterium tuberculosis;* air disinfection with ultraviolet irradiation; epidemiology and programmatic control of TB.

Steven Shapiro, MD; Professor in the Department of Environmental Health. Metalloproteinases in the pathogenesis of lung diseases and the role of neutrophil elastase in smoking-related emphysema.

Eric Silverman, MD; Assistant Professor in the Department of Environmental Health. Gene regulatory mechanisms, and gene sequence variability as it effects the pathogenesis of asthma and other pulmonary diseases.

George P. Topulos, MD; Assistant Professor in the Department of Environmental Health. Pulmonary micromechanics and pulmonary circulation.

Richard Verrier, PhD; Associate Professor in the Department of Environmental Health. Neural triggers of sudden cardiac death; cardiac electrophysiology; T-wave alternans; coronary hemodynamic function; novel delivery systems for anti-arrhythmic therapy.

Scott T. Weiss, MD, SM; Professor in the Department of Environmental Health. Natural history of chronic lung disease; epidemiology of asthma and hypertension; cardiovascular, occupational, environmental, and genetic epidemiology.

Adjunct Faculty

Allard E. Dembe, MA, DS. University of Massachusetts Medical School.

Ellen A. Eisen, SM, SM, SD. University of Massachusetts, Lowell.

Alan Eschenroeder, BME, PhD. Consultant.

Timothy E. Ford, PhD. Montana State University.

Robert B. Pojasek, PhD. Cambridge Environmental, Inc.

David H. Wegman, MD, SM. Department of Work Environment, University of Massachusetts, Lowell.

Department of Epidemiology

Epidemiology—the study of the frequency, distribution, and determinants of disease in humans—is one of the fundamental sciences of public health. While individual epidemiologists have different study objectives and use many approaches, the aims of epidemiologic research ultimately lie in the prevention or effective control of human disease.

The Department of Epidemiology has a long tradition of teaching and research in the epidemiology of cancer, cardiovascular disease, and other chronic diseases, as well as in epidemiologic methodology. Current research in the department includes the role of viruses in the etiology of cancer; the connection between diet and risk of cancer, cardiovascular disease, and other major chronic diseases; the relationship between exposure to chemicals in the workplace and the development of cancer; the epidemiology of infectious disease; factors in early life predisposing individuals to chronic diseases; case identification and risk factors in mental disorders; health effects of drugs, vaccines, and medical devices; and causes of human infertility.

Degree Programs in Epidemiology

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, as well as a doctor of science (SD) and doctor of public health (DPH) program. For information about schoolwide requirements for master's and doctoral programs, see page 59.

Students in all degree programs choose from among fourteen areas of interest:

Cancer epidemiology In addition to research methodology, the curriculum in this area includes courses on the biology and genetics of cancer; the basic concepts and issues of cancer epidemiology; the roles of diet, oncogenic viruses, and occupational exposures in the etiology of cancer; the integration of biomarkers into research; the prevention of cancer; and research methods. Research opportunities for students include a large number of ongoing cohort and case-control studies within the department and in conjunction with the Dana-Farber/Harvard Comprehensive Cancer Center.

Cancer prevention This area provides students with knowledge of the science of cancer prevention, expertise in a specialized research area, skill in policy analysis, and an introduction to professional networks. Social and behavioral scientists prepare to advance alternative strategies for inducing behavioral change at the individual, institutional, community, or policy levels. Physicians prepare for careers as clinical investigators or public health practitioners specializing in cancer prevention. The program combines the interdisciplinary resources of the Harvard Center for Cancer Prevention and the Division of Cancer Epidemiology and Control in the Dana-Farber Cancer Institute.

Cardiovascular epidemiology This area provides training in research methodology and the epidemiology of cardiovascular diseases. Doctoral students conduct research in a substantive or methodological area related to cardiovascular epidemiology.

Clinical epidemiology This area is designed primarily for clinicians and other health care professionals who wish to develop the quantitative and analytic skills needed for clinical research. Students take core courses in epidemiology and biostatistics to develop basic skills in study design and analysis that will allow them to examine clinical questions related to the diagnosis and treatment of disease. Additional courses in epidemiology and courses offered by other departments address related topics such as health status and quality-of-life measurement, decision analysis, cost-effectiveness analysis, health services research, and quality improvement of health care.

While the appropriate content for this area may be covered by taking courses offered during the regular academic year (fall and spring semesters), requirements for the 40-credit SM degree in epidemiology may also be partially fulfilled by taking the summer courses offered through the Summer Program in Clinical Effectiveness. Students begin their program by taking a core set of clinical effectiveness courses during an initial summer period. They complete the SM program by taking advanced courses during the regular academic year and, if desired, during a second summer period. Alternatively clinical effectiveness students who only take courses during two summer periods can satisfy the requirements for the SM degree by completing a supervised research project. The content of this project typically entails the design and implementation of a clinical study, the analysis of the resulting data, and the creation of a manuscript of quality suitable for publication. An outline for this project must be submitted at time of application.

Environmental/occupational epidemiology This area is closely associated with the concentrations in environmental epidemiology and occupational health in the Department of Environmental Health. Students take courses in epidemiology, environmental health, occupational health, biostatistics, and toxicology. Doctoral students conduct research in a substantive or methodologic area related to environmental or occupational health.

Epidemiologic methods This area provides training in the development and application of new methods in epidemiologic research. Students learn to use and justify classical epidemiologic methods in study design, data analysis, and interpretation of results. Students also receive training in biostatistical areas most relevant to epidemiologic research. Recent innovations in epidemiologic methodology are introduced through advanced courses and tutorials. Doctoral students conduct research with faculty members in the development of new methodologies and in novel applications of existing methodologies. Those enrolling in this area of interest ordinarily have completed four semesters of college calculus and one semester of linear algebra.

Epidemiology of aging This area is geared toward those interested in the diseases and conditions, as well as research methods, specific to older populations. Social and cultural aspects of health in older persons are also covered. A range of relevant courses are offered, and students can take advantage of research opportunities in association with the Department of Nutrition, Channing Lab-

oratory, Division of Preventive Medicine at Brigham and Women's Hospital, and Hebrew Rehabilitation Center for the Aged.

Infectious diseases This area is designed to familiarize students with the epidemiology and biology necessary to understand the interactions of infectious agents, their hosts, and their vectors. Social and cultural aspects of infectious diseases and of related health services are covered, as are new and resurgent infectious diseases. Students in this area take courses in the Departments of Epidemiology, Immunology and Infectious Diseases, and Population and International Health. More advanced topics of infectious disease epidemiology are covered in tutorials with faculty members focusing on this area.

Molecular/genetic epidemiology This area introduces students to the application of molecular and genetic methods in epidemiology. These methods may be useful as measures of exposure, disease susceptibility, or disease outcome. Training encompasses family-based association methods, gene-mapping to identify the chromosomal localization of genes associated with disease, and fine mapping and identification of these genes. Population-based studies correlate variation in genes with disease risk and prognosis and assess gene-environment interactions. Relevant courses explore the genetic epidemiology of complex diseases, including cancer, cardiovascular disease, diabetes, psychiatric illnesses, Alzheimer's disease, and asthma, as well as individual variation in drug response (pharmacogenomics). Students can collaborate with the Department of Environmental Health (including the Program for Population Genetics), the Channing Laboratory, Dana-Farber Cancer Center, and other research groups.

Nutritional epidemiology Through courses in the Departments of Epidemiology and Nutrition, students in this area learn methods of nutritional assessment and their related strengths and weaknesses. Students also receive advanced training in the nutritional determinants of disease and in methods for analysis specific to research in nutritional epidemiology. Students can conduct research within several large prospective ongoing studies at HSPH and Harvard Medical School, including an examination of dietary factors in relation to cardiovascular disease, cancer, and other chronic diseases; a study of the interactions between nutritional and genetic determinants of disease; and the assessment of nutritional supplementation in relation to infectious agents and malnutrition.

Oral and dental health epidemiology This area prepares dentists and others interested in oral diseases for research and teaching careers in epidemiology with an emphasis on oral epidemiology and dental health. A new focus area is the links between oral conditions, nutrition, and systemic diseases such as coronary heart disease, stroke, and cancer. Students also participate in field research activities; case-control studies of oral health risk factors; or clinical trials designed to test preventive, diagnostic, or therapeutic interventions. This area of interest is jointly administered by the Department of Oral Health Policy and Epidemiology in the Harvard School of Dental Medicine and the HSPH Department of Epidemiology.

Pharmacoepidemiology This area focuses on the determinants of both unintended and expected effects of drugs and medical devices. Patterns of utilization of drugs and devices, cost-benefit and risk-benefit analyses, and investigation of the distribution of diseases possibly amenable to medical intervention represent important secondary themes. The Department of Epidemiology offers an intermediate-level course in pharmacoepidemiology and a variety of ongoing research projects. Relevant courses elsewhere in the school cover such areas as clinical trials, meta-analysis, drug regulatory affairs, decision analysis, and vaccine development. Students in pharmacoepidemiology have the opportunity to attend courses and congresses outside the school and are encouraged to undertake internships of up to three months in pharmaceutical firms or regulatory agencies. Students ordinarily have a prior degree in medicine or pharmacy. Others are expected to acquire substantially equivalent expertise in areas related to their research.

Psychiatric epidemiology This area introduces students to concepts and methods for studying the genetic and psychosocial factors that relate to the prevalence, incidence, and outcome of different types of psychiatric illnesses. Emphasis is given to issues of reliability

SONIA MATHEWS

Master's student, Department of Epidemiology

Sonia Mathews worked for a public health consultancy agency for three years before enrolling at Harvard. As a research assistant at the agency, charged with coordinating data collection for several large research studies, Mathews took a few courses at HSPH to increase her knowledge and abilities. She liked the classes so much that she left her job in order to return to school full time.

Those first classes, Mathews says, "reaffirmed my interest in public health and research. One of the things that attracts me about public health is that there are so many layers. There is research, developing and improving the knowledge base in a certain area. There is practice, being able to translate research into action and implement changes in a community. And there is policy development and analysis, being able to affect decision making."

Mathews plans to continue in the department as a doctoral student. She is interested in studying how modifiable lifestyle factors affect the risk of certain cancers and also in creating prevention strategies.

Mathews has been active in the Student Coordinating Committee, the school's student government. After a one-year term as a departmental representative, she served as the group's president. Being in the student government "is a great way to get the inside scoop about the school—how it runs—and influence changes that benefit student life."

and validity in studying such disorders among children, adolescents, and adults. The curriculum consists of six specialized courses, as well as related courses offered in the Departments of Epidemiology, Biostatistics, Maternal and Child Health, and Health and Social Behavior.

Reproductive epidemiology In addition to unique methodological issues, this area encompasses clinical, environmental, cancer, and infectious disease epidemiology. Reproductive epidemiologists choose as their interest the broad topic of the determinants and consequences of reproduction, including women's health and male infertility. Students can explore menarche, the menstrual cycle, infertility, conception, and pregnancy as endpoints or as factors influencing disease outcomes.

The Obstetrics and Gynecology Epidemiology Center, based at Brigham and Women's Hospital, offers the opportunity to gain experience in data collection and analysis of large-scale population- and clinical-based epidemiological studies. Students interested in occupational/environmental and genetic reproductive epidemiology may pursue projects within the Reproductive Epidemiologic Working Group, consisting of faculty members from HSPH and other major public health institutions around the world. Students may also collaborate with other faculty members at HSPH, Harvard Medical School, and the Harvard-affiliated hospitals. Students are encouraged and given guidance on how to submit their own research proposals for private or federal funding.

Master of Science in Epidemiology (80-credit and 40-credit programs)

The master's programs provide students with basic skills in epidemiologic and quantitative methods and in computing, in preparation for research or academic careers. Graduates have taken positions as researchers in university and hospital settings and as epidemiologists for public health agencies and private companies.

The 80-credit SM program is designed for individuals who hold a bachelor's degree and have a strong background in biology and mathematics. The 40-credit program is open to applicants with a medical degree or master's-level background in biology.

Required courses for the 80-credit and 40-credit programs are the same and include schoolwide requirements, elements of epidemiologic research, the design and analysis of case-control and cohort studies, and the analysis of rates and proportions.

In addition to epidemiology and statistics courses, students in the 80-credit program study the basic medical sciences and the biological aspects of public health problems. The program is primarily intended for students who expect to continue toward a doctoral degree. Recommended courses cover human physiology and the pathophysiology of human disease, regression and analysis of variance in experimental research and applied regression for clinical research, introductory cancer biology, principles of toxicology, and the practice of quantitative methods.

In the 40-credit program, remaining courses reflect areas of special interest and may include supervised research.

Doctor of Science in Epidemiology/ Doctor of Public Health

The doctoral programs are designed for students who plan careers in epidemiologic research or teaching or for those who aspire to leadership roles in the health professions. Recent graduates are working in major universities, medical schools, and research institutes. They also serve as epidemiologists for the National Cancer Institute, Centers for Disease Control and Prevention, other domestic and international governmental institutions, and private industry.

Applicants to the SD program should hold at least a bachelor's degree and have a strong background in biology and mathematics. For these individuals the degree generally takes four to five years to complete; candidates with relevant doctoral degrees may complete the program in three years. The DPH degree is available to students holding a prior doctorate and an MPH degree.

Normally most of the first two years is devoted to course work. Course requirements are the same as for the SM program, with the addition of courses on the practice of epidemiology, advanced epidemiologic methods, and principles of screening; and for nonphysicians, human

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Principles of Epidemiology
Introduction to Epidemiology
Elements of Epidemiologic Research
Design of Case-Control and Cohort Studies
Analysis of Case-Control and Cohort Studies
Practice of Epidemiology
Advanced Epidemiologic Methods
Introduction to Clinical Epidemiology
Epidemiology of Cardiovascular Disease
Epidemiology of Cancer
Epidemiologic Analysis of Outbreaks and Infectious Diseases
Epidemiology in Public Health Practice
Epidemiology of Adult Psychiatric Disorders
Environmental and Social Risk Factors for Psychiatric Disorders
Assessment Concepts and Methods in Psychiatric Epidemiology
Psychiatric Diagnosis in Clinic and Community Populations
Pharmacoepidemiology
Genetic Epidemiology of Diabetes and Its Complications
Cancer Prevention
Epidemiology of Infectious Diseases
Principles of Screening
Oral Epidemiology
Ophthalmic Epidemiology
Health Services Epidemiology
Analytical Aspects of Clinical Epidemiology
Predictive Modeling and Data Mining
Use of Biomarkers in Epidemiologic Research
Measuring Health Status
Seminar in Clinical Epidemiology
Genetic Epidemiologic Methods for Psychiatric and Other Disorders
Epidemiologic Methods Development—Past and Present
Molecular Biology for Epidemiologists
Molecular Epidemiology of Chronic Diseases
Studies in Molecular Epidemiology
Infections and Cancer
Information Management in Epidemiology
Epidemiology of Aging
Epidemiology of HIV Infection, Part I: Etiology, Natural History, and Transmission
Epidemiology of HIV Infection, Part II: Therapeutic and Prevention Interventions
Advanced Seminar in Breast Cancer Epidemiology
Mathematical Modeling of Infectious Diseases
Infectious Disease Epidemiology I and II
Epidemiologic Research in Obstetrics and Gynecology
Advanced Reproductive Epidemiology
Epidemiology of Neurologic Diseases
Implementing Prevention
Research in Clinical Epidemiology
Independent Study, Field Experience

physiology and the pathophysiology of human disease. Ten credits are also required in substantive courses offered by the department, 10 credits in advanced biostatistics courses, and 10 credits in a second minor field.

Funding may be available for U.S. citizens or permanent residents enrolled in the doctoral program or a postdoctoral fellowship program; depending on the specialty area, funding sources include the National Cancer Institute and the National Institute of Mental Health. For U.S. citizens and permanent residents interested in cardiovascular disease or aging, research traineeships may be available through Harvard Medical School. The National Institute of Aging also offers research traineeships for doctoral students, postdoctoral fellows, and physicians engaged in postdoctoral training.

RELATED OFFERINGS

Environmental epidemiology and occupational health concentrations, Department of Environmental Health, see pages 12 and 14.

Interdisciplinary concentration in molecular epidemiology, see page 57.

Interdisciplinary concentration in the epidemiology of infectious disease, see page 57.

Interdisciplinary concentration in women, gender, and health, see page 57.

Summer Program in Clinical Effectiveness, see page 58.

CONTACT INFORMATION

For more information about research and training in epidemiology, please contact coordinator of academic services, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.
Phone: 616-432-1055
Fax: 617-566-7805
Web: http://www.hsph.harvard.edu/Academics/epidem/index.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and exogenous hormones on health, particularly heart disease and cancer.

Alberto Ascherio, MD, MPH, DPH; Associate Professor of Nutrition and Epidemiology. Relation of dietary factors to the occurrence of human disease.

Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy. Social epidemiology; epidemiology of aging.

Stephen L. Buka, SM, SM, SD; Associate Professor of Maternal and Child Health and Epidemiology. Causes and prevention of behavioral and developmental disorders of children.

Kin-Wei Arnold Chan, MD, MPH, SD; Assistant Professor of Epidemiology. Pharmacoepidemiology.

David C. Christiani, MD, SM, MPH; Professor of Occupational Medicine and Epidemiology. Occupational diseases; biomarkers and molecular epidemiology.

E. Francis Cook, MA, SM, SD; Professor of Epidemiology. Epidemiologic methods; clinical epidemiology.

Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

Wafaie W. Fawzi, MB, BS, MPH, SM, DPH; Associate Professor of Nutrition and Epidemiology. Etiologies of infectious diseases with emphasis on dietary and nutritional causes; relationships of dietary factors to disease in pregnancy and childhood.

Susan E. Hankinson, MS, MPH, SD; Associate Professor of Epidemiology. Relationships between hormonal factors and risk of breast and ovarian cancers.

Frank B. Hu, MD, MPH, PhD; Associate Professor of Nutrition and Epidemiology. Diet and physical activity in relation to cardiovascular disease and type-2 diabetes; role of diet and lifestyle in preventing macrovascular complications in diabetics.

David J. Hunter, MB, BS, MPH, SD; Professor of Epidemiology. Cancer epidemiology; molecular epidemiology.

Frederick P. Li, MD, MA; Professor of Clinical Cancer Epidemiology. Inherited susceptibility to cancer; clinical and molecular epidemiology.

Marc Lipsitch, DPhil; Assistant Professor of Epidemiology. Theoretical, statistical, and experimental approaches to population biology and the epidemiology of infectious diseases.

Giancarlo Logroscino, MD, PhD. Associate Professor of Epidemiology. Neurodegenerative diseases epidemiology, including Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, and epilepsy; epidemiologic methods; genetic epidemiology; idiopathic dystonias.

Richard R. Monson, MD, SM, SD; Professor of Epidemiology and Associate Dean for Professional Education. Relationship between the workplace, the environment, and disease.

Nancy E. Mueller, SM, SD; Professor of Epidemiology. The role of viruses in the etiology of cancer; cancer epidemiology.

Megan Murray, MD, MPH, SD; Assistant Professor of Epidemiology. Use and evolution of molecular markers in tuberculosis; transmission dynamics of infectious diseases; study of vaccine effects.

Eric B. Rimm, SD; Associate Professor of Epidemiology and Nutrition. Relation of dietary factors to the occurrence of human diseases, in particular cardiovascular disease.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Development of analytic methods for drawing causal inferences from complex observational and randomized studies with time-varying exposures or treatments.

Joel D. Schwartz, PhD; Associate Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods.

George R. Seage III, MPH, DSc; Associate Professor of Epidemiology. HIV epidemiology; determining the clinical outcomes of HIV patients.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Binary data models with measurement error and misclassification in model covariates.

Sherri O. Stuver, SD; Associate Professor of Epidemiology. Cancer epidemiology; virus-associated disease.

Dimitrios V. Trichopoulos, MD, SM; Vincent L. Gregory Professor of Cancer Prevention. Cancer epidemiology.

Alexander M. Walker, MD, MPH, DPH; Henry Pickering Walcott Professor of Epidemiology. Pharmacoepidemiology; study design for observational research.

Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Relation of dietary factors to the occurrence of human disease, in particular heart disease and cancer.

Xiping Xu, MD, PhD, SM; Associate Professor of Occupational Epidemiology. Environmental, occupational, and genetic epidemiology of respiratory, cardiovascular, and metabolic diseases.

Secondary Appointments

(primary appointments at Harvard Medical School or Harvard School of Dental Medicine)

Deborah Blacker, MD, SD; Associate Professor in the Department of Epidemiology. Genetic epidemiology of affective disorders and of Alzheimer's disease.

Julie Buring, MS, SD; Professor in the Department of Epidemiology. Epidemiology of chronic disease, primarily cardiovascular disease and cancer; epidemiologic methodology, especially clinical trials.

Carlos A. Camargo, Jr., MPH, MD, DPH; Assistant Professor in the Department of Epidemiology. Asthma and chronic obstructive pulmonary disease.

Graham A. Colditz, MB, BS, MPH, DPH; Professor in the Department of Epidemiology. Cancer epidemiology; diet and chronic diseases.

Gary C. Curhan, MD, SM, SD; Assistant Professor in the Department of Epidemiology. Nephrolithiasis risk factors and prevention; analgesic nephropathy; hypertension risk factors and prevention; hypertensive disorders of pregnancy; interstitial cystitis.

Immaculata DeVivo, MPH, PhD; Assistant Professor in the Department of Epidemiology. Etiology of cancer, specifically the relationship between genetic variation and disease risk for future prevention.

Chester W. Douglass, DMD, MPH, PhD; Professor in the Department of Epidemiology. Oral epidemiology and health policy.

Kathleen M. Egan, MPH, SD; Assistant Professor in the Department of Epidemiology. Epidemiology of molecular genetics of intraocular tumors; survival determinants in choroidal melanoma; epidemiology of breast and ovarian cancer.

Edward L. Giovannucci, MD, MPH, SD; Associate Professor in the Departments of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes; methodologies to measure dietary factors in epidemiologic studies.

Francine Grodstein, SD; Assistant Professor in the Department of Epidemiology. Aging; health effects of exogenous hormones; risk factors for Alzheimer's disease.

Bernard L. Harlow, MPH, PhD; Associate Professor in the Department of Epidemiology. Survey research methods; risk factors associated with borderline and malignant ovarian tumors; epidemiologic indicators for adverse obstetrical outcomes.

Catherine Hayes, DMD, SM, DMSc; Assistant Professor in the Department of Epidemiology. Epidemiology of craniofacial anomalies; outcomes research in the area of periodontal disease.

Kaumudi J. Joshipura, SM, SD; Assistant Professor in the Department of Epidemiology. Oral epidemiology.

I-Min Lee, MB, BS, MPH, SD; Associate Professor in the Department of Epidemiology. Epidemiology of cancer; physical activity and fitness and cancer incidence.

JoAnn E. Manson, MD, MPH, DPH; Professor in the Department of Epidemiology. Chronic disease epidemiology.

Karin B. Michels, MS, MPH, SD, MSc; Assistant Professor in the Department of Epidemiology. Nutritional epidemiology and methodology; perinatal and reproductive risk factors for breast cancer.

Murray A. Mittleman, MDCM, MPH, DPH; Assistant Professor in the Department of Epidemiology. Epidemiology of acute risk factors triggering myocardial infarction and stroke; methodological problems in implementing case-crossover studies.

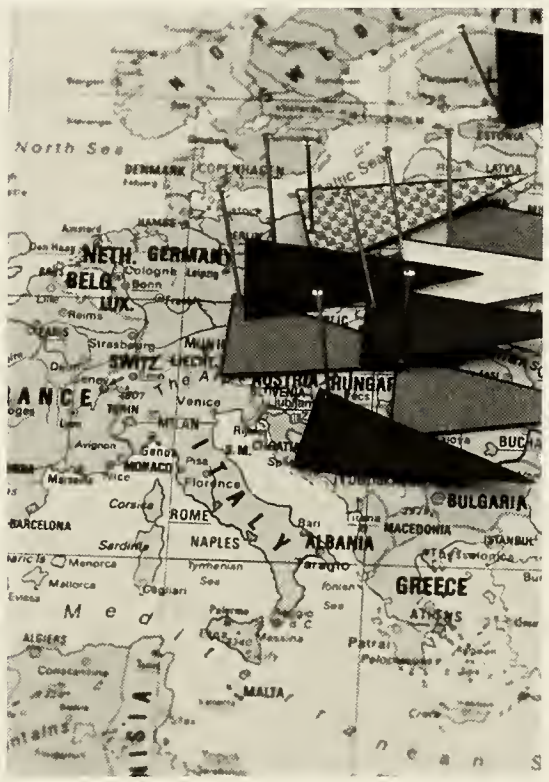
Jane M. Murphy, PhD; Professor in the Department of Epidemiology. Longitudinal studies of psychiatric epidemiology in general populations.

Johanna M. Seddon, MD, SM; Associate Professor in the Department of Epidemiology. Ophthalmology.

Daniel E. Singer, MA, MD; Professor in the Department of Epidemiology. Preventive health care.

Ming T. Tsuang, MD, PhD; Professor in the Department of Epidemiology. Follow-up and family studies of psychiatric disorders with emphasis on schizophrenia and affective disorders.

Shumin Zhang, MD, MSc, SD; Assistant Professor in the Department of Epidemiology. Etiology of cancer; nutritional epidemiology; health effects of antioxidants, folate, alcohol, lipids, and obesity; biomarkers of nutrients.



Adjunct Faculty

Hans-Olov Adami, MD, PhD. University Hospital, Uppsala, Sweden.

Monique M. B. Breteler, MSc, MD, PhD. Erasmus Medical Center, Rotterdam, the Netherlands.

Richard C. Dicker, MD, SM. Centers for Disease Control and Prevention.

Anders Ekbom, MB, MD, PhD. University Hospital, Uppsala, Sweden.

Albert Hofman, MD, PhD. Department of Epidemiology and Biostatistics, Erasmus University Medical School, Rotterdam, the Netherlands.

Chung-cheng Hsieh, MPH, SM, SD. Division of Biostatistics and Epidemiology, University of Massachusetts Medical Center.

K. Malcolm Maclure, SM, SD. Ministry of Health, Province of British Columbia, Canada.

Ralph S. Paffenbarger, Jr., MD, DrPH. Stanford University.

Kenneth J. Rothman, DMD, MPH, DPH. Departments of Epidemiology and Community Medicine, Boston University.

Susan L. Santangelo, SD. Department of Psychiatry, New England Medical Center at Tufts University School of Medicine.

Ralph J. Timperi, Jr., MPH. Massachusetts Department of Public Health.

Gwen L. Zornberg, MD, MS, ScD. Boston University School of Public Health.

Department of Health & Social Behavior

The mission of the Department of Health and Social Behavior is to identify the social and behavioral determinants of health and to develop and evaluate interventions and policies leading to the improvement of the public's health and quality of life.

The department accomplishes this aim by integrating knowledge and methods from the social sciences with traditional core sciences of public health. The department's educational mission is to train both scholars and practitioners: scholars whose research will illuminate basic social determinants of health and who will identify and test innovative social interventions; practitioners who are skilled in designing, implementing, and evaluating health-enhancing interventions in action settings and who appreciate the social ecology of health behavior as well as social and policy leverage points.

Degree Programs in Health and Social Behavior

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, as well as a program leading to the doctor of science (SD) degree. The department requires one core HSB course as well as specified courses for master's and for doctoral students. For information about schoolwide requirements for master's and doctoral degrees, see page 59.

The department highlights three areas of interest. Doctoral students declare an area of interest; master's students are not required to declare an area of interest but are encouraged to take course work in all three.

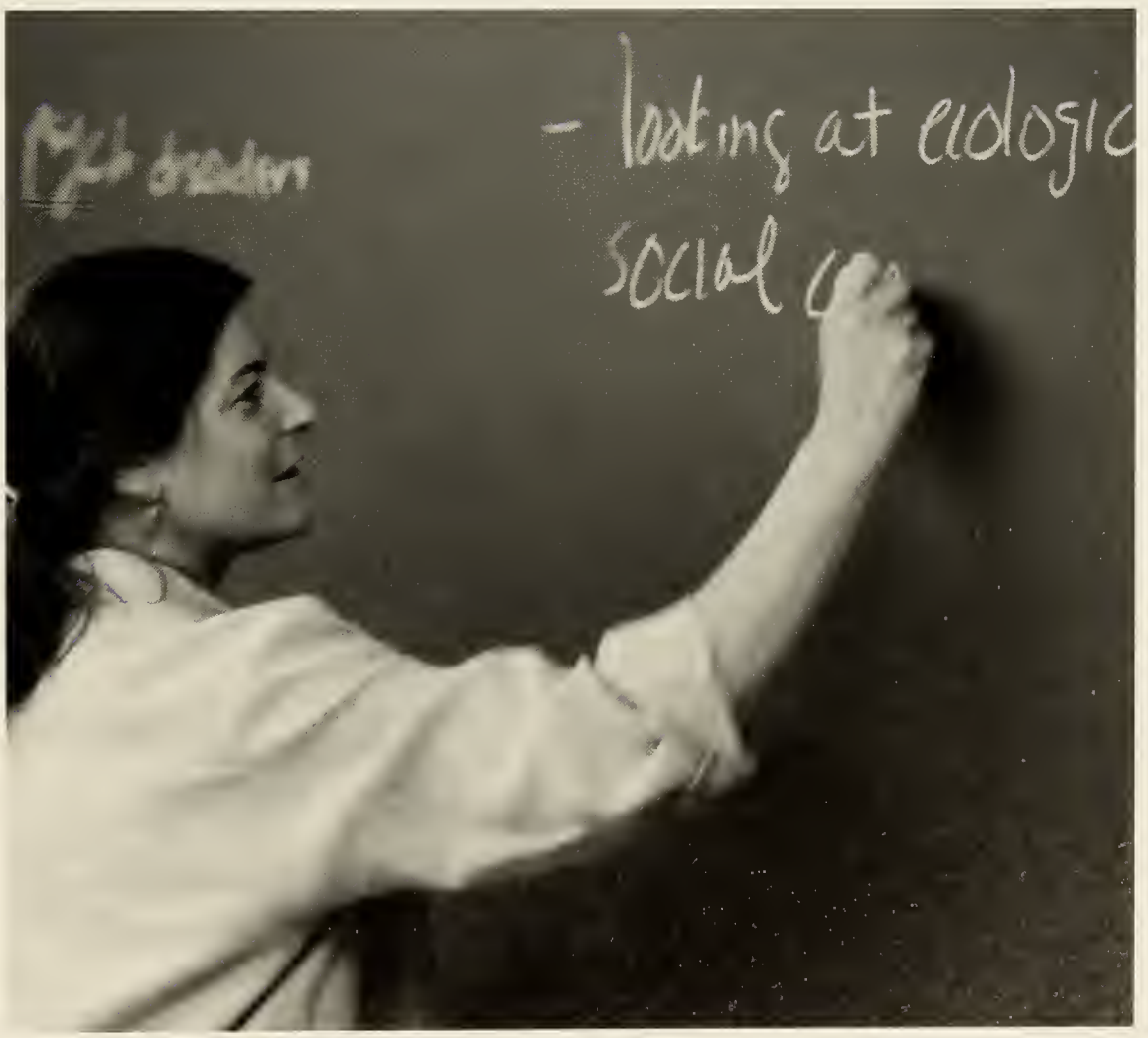
HSB areas of interest are as follows:

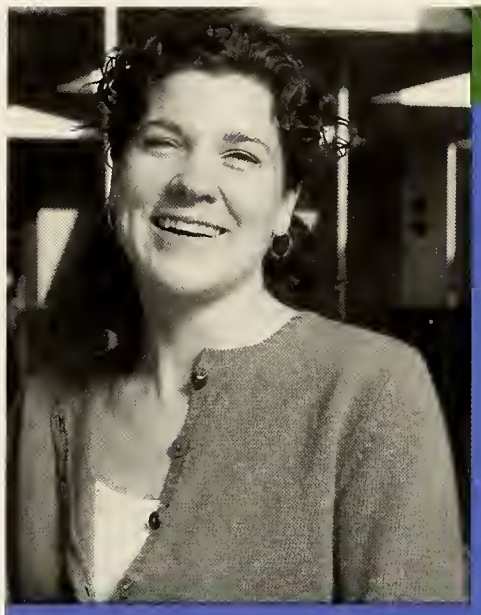
Health and social policy A wide range of social policies–including but not limited to labor, poverty, family, housing, and educational policy—have a dramatic impact on health. This area of interest prepares students to design new and improve existing social policies and focuses on strategies for the successful implementation of social policies that improve health. Students who study in this area may be interested in working on public policy through research, within the government, or in a nonprofit organization.

Planned social change This area of interest focuses on the application of theory in the design of intervention programs, as well as on research and evaluation methodology. The area includes work on interventions using randomized clinical trial designs and quasi-experimental approaches. Attention is given to the following design steps: problem diagnosis, assessment, formative research, program design, and evaluation. The social settings for interventions may be communities, workplaces, schools and colleges, and health care facilities. Populations of interest include those who are underserved, marginalized, and in special need. Intervention strategies include educational interventions, community organizing and development, social marketing, communication, adult-learning approaches, and advocacy.

Social determinants of health This area of interest focuses on the analysis of the major social conditions that affect the health of populations. Research emphasizes socioeconomic position, social and economic inequality, discrimination, social networks and support, social capital, work conditions, and psychological states. Seminars, tutorials, and courses enable students to explore a range of health consequences of various social factors by studying varied subgroups, at different times and places and under diverse and changing conditions. Students examine mechanisms and processes through which social factors exert their impact, and also investigate mechanisms that mediate or moderate relationships between social factors and health outcomes.

Limited funding is awarded on a competitive basis to qualified applicants in both master's and doctoral programs. A fellowship for doctoral students is also available in the area of cancer prevention, and some doctoral fellowships may also be available for underrepresented minorities.





THERESA OSYPUK

Master's student, Department of Health and Social Behavior

Before coming to HSPH, Theresa Osypuk worked as a campaign director for the Ad Council, a nonprofit organization that creates public service announcements for national social issues. While at the Ad Council, she helped to develop campaigns to prevent youth violence and to promote gun safety. Eventually, she says, "I found that I was more interested in researching the issues themselves than in creating advertising about them." She chose to return to school to investigate the causes of social problems like poverty and their influence on health.

"I came to HSPH," states Osypuk, "because the program in this department provided the flexibility to explore the issues I was interested in from different perspectives at the different Harvard schools, while also learning methodological skills within the public health discipline."

Osypuk is currently focusing on the roots of inequality in America. She says that courses such as *Society and Health* and *Place, Migration, and Health* have resonated with her because "they put together many of the things that I've believed but didn't wholly understand. I believe that social policy—laws—affect how healthy or unhealthy people become. But often, because the health effects are several steps removed from the policy, we do not see the link."

Osypuk plans to continue her education at the doctoral level and then hopes "to pursue a career researching social policy in academia or possibly in a policy organization."

Master of Science in Health and Social Behavior (80-credit and 40-credit programs)

This professional master's program prepares students for work in a variety of community, public, and private settings with a focus on program design, public policy supervision, and evaluation; and for work as members of research teams. One recent graduate is serving as the evaluator on a violence prevention program for adolescents; another works with a nonprofit organization coordinating international efforts related to women's health.

Applications are encouraged from students who have a strong social science and/or natural science background, public health experience, and defined public health goals. Solid math and writing skills and successful experience with course work requiring critical reading and writing, drawing inferences, and offering analysis are crucial. Students in the 80-credit program enter with a background (often a major) in the social/behavioral sciences and experience in the field; previous graduate work is not required. For the 40-credit program students must have a related graduate degree and experience in the social/behavioral sciences or a public health field.

In the 80-credit program students must earn at least 20 ordinal credits in departmental courses. After fulfilling HSPH, HSB, and practice core requirements, students are encouraged to delineate professional goals and to develop an area of expertise. They often focus on a subject area (such as AIDS, addiction, cardiovascular risk reduction, cancer, environmental health, health education, the health of families, labor and workplace issues, literacy, or women's health) and/or a skill area (such as program design, program evaluation, communication, public policy, or marketing). Students are encouraged to complete an internship as part of their training.

For the 40-credit program students must earn 15 ordinal credits in departmental courses. After fulfilling core HSPH, HSB, and practice core requirements, students are encouraged to focus their work in a specific content or skill area. They should work closely with their advisers to develop a study plan early in the fall semester.

Doctor of Science in Health and Social Behavior

The doctoral program trains students as scholars and researchers who will identify new social and behavioral risks, work in health and social policy, and test innovative social interventions; or as practitioners who will design, implement, and evaluate health-enhancing interventions or public policies. Recent graduates are working in research and academic settings, including schools of public health.

Most students enter the doctoral programs with a strong foundation in the social and behavioral sciences and with an earned master's degree. The department accepts a small number of students without a master's degree directly into the doctoral program.

Doctoral programs are offered in the areas of interest described earlier (health and social policy, planned social change, and social determinants of health). Students should consult the department's doctoral handbook for a listing of required courses in each area.

RELATED OFFERINGS

MPH concentration in family and community health, see page 54.

Interdisciplinary concentration in women, gender, and health, see page 57.

CONTACT INFORMATION

For more information about research and training in health and social behavior, please contact Michele Brooks, academic coordinator, Department of Health and Social Behavior, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3775
Fax: 617-432-3123
E-mail: mbrooks@hsph.harvard.edu

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy. Social epidemiology; epidemiology of aging.

Dolores Acevedo-Garcia, MPA, PhD; Assistant Professor of Health and Social Behavior. Effects of residential segregation on minority health; health effects of welfare reform and immigration policies on U.S. immigrants and citizens.

Norman B. Anderson, MA, PhD; Professor of Health and Social Behavior. Race, ethnicity, social class, and health; mass media approaches to public health.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course listings are available at http://www.hsph.harvard. edu/registrar/courses.

Social and Behavioral Dimensions of Public Health
Society and Health
Innovative Strategies in Health Education
Communication in Health Care Settings
Race, Ethnicity, and Health: Perspectives from the Social and Behavioral Sciences
Health Promotion Through the Mass Media
Developing Radio Communications
Health Literacy
History, Politics, and Public Health: Theories of Disease Distribution Across Time and Culture
Introduction to High-Risk Behaviors: Epidemiology, Prevention, and Public Policy
Psychosocial Theories of Health and Health Behavior
Health and Social Policy in the Workplace
Planned Social Change
Psychosocial Aspects of Aging
Future of Health Communication: New Media and Emerging Technologies
Community Intervention Research Methods
Health and Social Behavior Department Proseminar
Qualitative Research Methods for Public Health
Social Epidemiology
Tobacco Control in the U.S.: Past, Present, and Future
Practice of Preventing Intimate Partner Violence
Social and Behavioral Research Methods I and II
Multilevel Methods for Health and Social Behavioral Research
Approaches to International Tobacco Control
Inequality and Health
Health and Social Behavior Master's Seminar
Health and Social Behavior Doctoral Seminar
Policy Analysis Methods for Public Health
Place, Migration, and Health
Health and Social Policy Doctoral Seminar
Independent Study, Field Experience

Elizabeth M. Barbeau, MPH, ScD; Assistant Professor of Health and Social Behavior. Workplace health and safety policy; work-site cancer prevention; tobacco policy; health inequalities.

Karen M. Emmons, MA, PhD; Associate Professor of Health and Social Behavior. Cancer prevention; smoking and health effects of environmental tobacco smoke; health care and community-based interventions.

Steven L. Gortmaker, SM, PhD; Professor of Health and Social Behavior. Statistical evaluation methods; socioeconomic position and child health; social, behavioral, environmental, and policy influences on obesity and other chronic conditions.

S. Jody Heymann, MPP, MD, PhD; Associate Professor of Health and Social Behavior. Influence of social, labor, education, and poverty policies on health; strategies for decreasing the incidence and impact of diseases burdening poor and marginalized populations.

Ichiro Kawachi, MD, PhD; Associate Professor of Health and Social Behavior. Social inequalities in health, especially related to income distribution; stress and cardiovascular disease; quality of life and healthy aging; tobacco control.

Bruce P. Kennedy, MEd, EdD; Assistant Professor of Health and Social Behavior. Social determinants of health inequalities; interactions between social determinants of child and adolescent health and developmental vulnerabilities.

Nancy Krieger, MS, PhD; Associate Professor of Health and Social Behavior. Social inequalities in health, especially regarding race/ethnicity, social class, and gender; cancer, especially breast cancer; cardiovascular disease, especially hypertension.

Laura D. Kubzansky, MSc, PhD, MPH; Assistant Professor of Health and Social Behavior. Psychosocial determinants of health; social inequality and health; emotion and cardiovascular disease.

Rima E. Rudd, MSPH, ScD; Lecturer on Health Education. Public health and adult education pedagogy; normative change and change strategies, including small-group communications, community organizing, and social marketing.

Jay G. Silverman, PhD. Assistant Professor of Health and Social Behavior. Effects and prevention of intimate partner violence (IPV) against adolescent and adult women, including effects of custody arrangements on children and IPV prevention in immigrant communities.

Glorian Sorensen, MPH, PhD; Professor of Health and Social Behavior. Cancer prevention in the workplace; intervention research in community and occupational settings.

Henry Wechsler, AM, PhD; Lecturer on Social Psychology. Alcohol and drug use and related high-risk behaviors among youth; epidemiologic, preventive, and public policy approaches to substance-abuse prevention.

Secondary Appointments

(primary appointments at Harvard Medical School)

Lawren H. Daltroy, MPH, DrPH; Associate Professor in the Department of Health and Social Behavior. Social support, social psychology, and decision-making theory applied to patient education and doctor-patient communication in chronic disease; health disparities; functional status measurement.

Thomas S. Inui, MD, ScM; Professor in the Department of Health and Social Behavior. Primary care effectiveness; health-related behavior; clinical prevention.

Sue Ellen Levkoff, MSW, SM, SD; Associate Professor in the Department of Health and Social Behavior. Influence of culture on the experience of and response to dementia symptoms; prevention of excess disability in cognitively impaired aged.

Nancy A. Rigotti, MD; Associate Professor in the Department of Health and Social Behavior. Disease prevention in medical practice; development and evaluation of smoking cessation methods in health care settings; evaluation of tobacco control public policy.

Adjunct Faculty

H. William DeJong, MA, PhD. Boston University School of Public Health.

Roberta E. Goldman, MA, PhD. Boston University School of Medicine.

Michael G. Marmot, MB, MPH, PhD. International Centre for Health and Society.

Anne M. Stoddard, SM, SD. University of Massachusetts.

Department of Health Policy & Management

The Department of Health Policy and Management is a mission-oriented department concerned with improving the health care delivery system and mitigating public health risks in the United States and abroad. The department is dedicated to resolving major management and health policy problems through original research, advanced training, and dispute resolution.

Research priorities in the Department of Health Policy and Management are organized into nine broad areas: health financing and insurance, including the creation of new physician payment systems and the design of public policies dealing with rising insurance premiums; management of health hazards, including use of risk assessment to set priorities for environmental health protection; study of the causes and etiology of injury and the application of that work to the development and evaluation of prevention and intervention strategies and policy; management of health care organizations, encompassing the application of corporate strategic planning concepts to the challenges faced by health systems and pharmaceutical firms; management and evaluation of medical technology, including the meta-analysis of data from clinical trials; business and labor in health, including the negotiation of occupational safety and health care benefits in the collective bargaining process; international health, including evaluation of the cost-effectiveness of health programs in developing countries; quality of health care, encompassing the design of better methods to measure quality; and health care reform, involving the development of partnerships between the department and the corporate community to explore critical aspects of health policy and management.

The department's problem-solving orientation is exemplified by its strong ties to leading health practitioners in hospitals, managed-care plans, community health centers, health advocacy groups, corporate medical departments, health and environmental consulting firms, state and local health departments, legislative committees, federal regulatory agencies, and international agencies. Practical skills are emphasized by an interdisciplinary faculty that includes management specialists, decision analysts, accountants, physicians, lawyers, policy analysts, economists, political scientists, and program evaluators.

Degree Programs in Health Policy and Management

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, a nonresidential, part-time SM in health care management for physician and dental executives, and a doctor of science (SD) program. The department also participates in the universitywide doctor of philosophy (PhD) Program in Health Policy. An environmental science and risk management area of interest is offered jointly with the Department of Environmental Health. For information about schoolwide requirements for master's and doctoral degrees, see page 59.

Master of Science in Health Policy and Management (80-credit and 40-credit programs)

The 80-credit SM program emphasizes professional skills and concepts; a solid grounding in the substance of health problems; rigorous quantitative training; and a curriculum that combines professional, academic, and clinical activities. Acquired knowledge is applied to practical situations through a required summer internship program and a field research project. This professional program is designed for students who are building careers in health-related fields and who aspire to leadership roles in the public or private sector. Recent graduates have taken positions in local, state, and federal government agencies; consulting companies; public policy research organizations; community health centers; hospitals; health plans; and pharmaceutical companies. Others have gone on to doctoral and fellowship programs.

Applicants to the 80-credit program come from a wide variety of undergraduate fields. They are expected to have full-time work experience and an academic record, particularly in quantitative and analytical courses, that suggest outstanding potential in the areas of health policy and management. Applicants should have at least two years of relevant post-baccalaureate work experience in the health field; exceptions are occasionally made for outstanding candidates. Deferred admission is available for applicants who demonstrate strong potential but who lack sufficient professional experience in the health sector. These applicants work within the health field in positions approved by the program for a minimum of one year before matriculating.

Of the 80 credits necessary to earn the SM, required courses account for 30 to 35. In addition to fulfilling schoolwide requirements, students must satisfy the requirements of at least one of the three areas of interest: management, for students pursuing management careers in public- or private-sector health institutions; policy, for those who wish to become involved in the formulation of health policy, including medical care policy, heath finance and insurance, access to health care, payment to institutions and practitioners, political analysis and strategy, and medicare and medicaid reform; and research, for students looking toward doctoral education and research careers in fields such as health economics, quality of care, technology assessment, health decision analysis, and advanced statistical analysis. The requirements for the management, policy, and research areas of interest are described in a guide available from the department. After the required credits have been completed, students are encouraged to enroll in relevant courses at Harvard Business School, Kennedy School of Government, and Harvard Graduate School of Education.

The 40-credit SM program is designed for students pursuing research careers in public- or private-sector health care institutions, particularly physicians and other candidates with relevant advanced degrees who desire intensive training in analytic and quantitative skills. The degree is appropriate for students interested in either domestic or international research questions. Recent graduates have taken research positions at academic medical centers and other health care organizations.

Applicants to the 40-credit program should hold graduate medical or other professional degrees and have significant experience in health services. They typically expect to devote a substantial portion of their careers to research in areas such as health services research, cost-effectiveness analysis, and clinical decision making.

Students fulfill schoolwide requirements and take up to 10 tutorial credits and an additional 10 credits in courses within the department. Recommended electives include upper-level courses in biostatistics, epidemiology, health economics, health services research, health decision sciences, quality improvement, technology assessment, and program evaluation.

Master of Science in Health Care Management

The SM in health care management is a 40-credit, two-year, part-time, nonresidential degree program, which trains clinicians in the executive skills required for management. This professional program is targeted to midcareer MDs, DMDs, and DDSs with significant management responsibilities who wish to be more effective in their roles in the health care sector.

The program includes course work on strategy determination, financial analysis, negotiation, organizational behavior, operations management, information systems, and quality-of-care management. Degree candidates are required to spend three weeks each summer on campus, as well as five four-day weekends (Friday through Monday) each academic year. Scheduled teleconferences, an estimated ten to fifteen hours per week of assignments, and a final practicum are also required.

This is a closed-cohort learning situation. Attendance at all sessions is mandatory, and previous courses and/or degrees will not be applied to degree requirements. No auditing or cross-registration is allowed.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Pharmacoeconomics and Economic Evaluation of Medical Technology

Role of the Physician Manager in Health Care

Economic Analysis for Public Health (introductory)

Economic Analysis (intermediate)

Health Care Regulation and Planning

Economics of Health Policy

Medical Malpractice and Risk Management

New Developments in Health Law

Program Evaluation in Health Policy

Public Health Law

Health Care Law and Policy

Advanced Topics in Health Law and Policy

Financial Management and Control

Public Speaking for Managers

Legal and Ethical Issues in the AIDS Epidemic

Introduction to the New American Health Care System: Law, Policy, and Management

Managing People in Health Care Organizations

Strategic Marketing Management in Health Systems

Managed Care Policy Issues

Strategic Use of Information Systems in Health Care Delivery

Applied Financial Analysis of Health Care Organizations I and II

Principles of Injury Control

Health Policy in the United States

Politics and Strategies for Change in Health Policy

Health Economics: Economic Analysis of the Health Care System

Pharmaceutical and Biotechnology Industries: Public Policy and Regulatory Issues

Public Health Leadership Skills

Seminar in Health Policy

Political Analysis and Strategy for U.S. Health Policy

Quality Improvement in Health Care

Payment Systems in Health Care

Exploring the Interface of Public Health and Medicine

Comparative Health Systems of Industrialized Societies

Financing Health Care in Developing Countries

Oral Health Policy Research Seminar

Health Policy Issues: Access to Dental Services

Survey Methods and Applications in Health Services Research

Current Issues in Health Policy

Decision Theory

Environmental Health Risk: Concepts and Cases

Decision Analysis in Clinical Research

Research Seminar on Risk and Decision Analysis

Applied Research and Practice in Health Policy and Management

Applied Research in the Law of Health Policy and Management

Research Ethics

Public Opinion, Polling, and Public Policy

Mental Health, Policy, and Economics in the United States

Introduction to Management of Health Care Organizations

Medical Informatics

Developing Questionnaires to Measure Outcomes of Health Care

Quality Measurement in Health Care

Quality Improvement in Health Care

American Violence: The Intersection Between Home and Street

Organizing Consumer and Community Interests in the Health System

Universal Health Insurance: Search for Justice, Efficiency, and Quality

Multidimensional Problem Solving for Public Health Practice

Racial and Ethnic Disparities in Health: Historical and Contemporary Issues

Independent Study, Field Experience

Doctor of Science in Health Policy and Management

The SD program in health policy and management is designed for physicians, lawyers, and other professionals who are interested in doctoral-level research training in health policy and who are committed to applied, interdisciplinary research. The program prepares graduates to perform research in the academic or professional realm.

Applicants must hold an MD, a DDS, a PhD, or a JD degree. Moreover, applicants should have a strong aptitude in a quantitative discipline (demonstrated by prior academic performance, work experience, and standardized test scores), experience in the health sector, and the ability to perform original and independent work. Applicants should indicate their anticipated area of interest within the department and anticipated faculty mentor (if known) in their application essay.

Candidates complete a set of required courses in epidemiology, biostatistics, decision science, economics, program evaluation, health politics, and public health law (lawyers only). In addition, each student works closely with a faculty adviser to develop an individual plan of study. While students in this program have the opportunity to take courses throughout the university, all required courses are offered through HSPH.

Financial aid is available to applicants admitted to the program, especially from the Agency for Healthcare Research and Quality and the National Institute of

EDUARDO PESQUEIRA

Master's student, Department of Health Policy and Management

Eduardo Pesqueira was living in Mexico City, working as a primary care physician, when he was asked to join the Mexican Ministry of Finance. He was part of a governmental team that devised the rules for the newly created prepaid medical-service industry.

As that project came to a conclusion, Pesqueira knew that he wanted to learn more and be better able to make health policy. He applied to several schools and chose HSPH. He explains, "Harvard offers a wide perspective. Not only do you have the resources of the School of Public Health to draw upon, but there is also cross-registration to other schools and academic and cultural events throughout the university. This allows for interaction with students and faculty with a variety of interests and expertise."

Between his first and second years at HSPH, Pesqueira did an internship in California investigating migrant health issues. "We were looking at alternatives for better health care for migrant workers," he says.

In the future Pesqueira intends to do academic research and teach or to design and evaluate health policies in a government agency.

Mental Health. Full tuition and stipend are available to admitted minority students with demonstrated need.

Doctor of Philosophy in Health Policy

The doctor of philosophy in health policy is a collaborative program of five Harvard University faculties: the Graduate School of Arts and Sciences, School of Public Health, Medical School, Kennedy School of Government, and Business School. Because this is an interfaculty program, enrolled students take courses throughout the university. The PhD is awarded by the Faculty of Arts and Sciences. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Health Policy. The deadline for applying to the PhD program is December 16, 2002.

Individuals with doctoral-level training in health policy are highly sought as teachers in institutions of higher learning and/or as researchers. Graduates of the PhD Program in Health Policy are employed in schools of public health; medical schools; schools of public policy; and such organizations as the Kaiser Family Foundation, the Institute for Ethics at the American Medical Association, the RAND Corporation, and the Urban Institute.

Applicants must submit GRE or GMAT exam scores that are less than five years old, and individuals whose native language is not English must take the TOEFL. Preference is given to applicants with either relevant work experience or some prior graduate work, although a graduate degree is not required for admission.

Degree requirements include approximately two years of course work; a concentration in one academic discipline (decision science, economics, ethics, evaluative science and statistics, management, medical sociology, or political analysis); at the thesis stage specialization in one of four policy areas (environmental health, health care services, mental health, or public health); general and concentration exams (usually at the end of the second year); a thesis prospectus and oral examination; a thesis based on original research; and a thesis defense.

Financial aid is available to applicants admitted to the program, especially from the Agency for Healthcare Research and Quality and the National Institute of Mental Health. Full tuition and stipend are available to admitted minority students with demonstrated need.

Postdoctoral Fellowships

The department offers two-year postdoctoral fellowships to candidates who wish to do independent research in such areas as quality of medical care, technology assessment and cost-effectiveness, health care policy, management of health care organizations, and AIDS policy. The program emphasizes methodology in evaluation research, decision science, economics, and organizational analysis and permits fellows to design individualized programs of study. Fellows may also apply for admission to a formal degree program. Candidates must hold an MD, DDS, PhD, or equivalent degree and must be U.S. citizens or permanent residents. Applicants must submit a curriculum vitae, three letters of reference, and a statement describing career goals, research interests, and reasons for applying. The application deadline is November 15, 2002, for a fellowship beginning in July 2003.

RELATED OFFERINGS

Environmental science and risk management area of interest, Department of Environmental Health, see page 13.

Health decision sciences concentration, Department of Biostatistics, see page 5.

MPH concentrations in health care management and in law and public health, see page 54.

CONTACT INFORMATION

For more information about SM and SD programs in health policy and management, please contact Janet Weinstein-Zanger, director of academic programs, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4511
Fax: 617-432-3699
E-mail: jweinste@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/hpm

For more information about the SM degree in health care management, please contact Sharon O'Brien, administrative director, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4324
E-mail: smobrien@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mhcm

For the PhD program on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

For specific information about the PhD program, please contact Joan P. Curhan, director, PhD Program in Health Policy, 79 John F. Kennedy Street, Cambridge, MA 02138.
Phone: 617-496-5412
Fax: 617-496-2860
E-mail: Joan_Curhan@harvard.edu
Web: http://www.fas.harvard.edu/~healthpl

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Arnold M. Epstein, AM, MD; John H. Foster Professor of Health Policy and Management. Access and quality of care, especially in disadvantaged populations.

Deborah H. Bennett, MS, PhD; Assistant Professor of Environmental Health and Risk Assessment. Fate and transport of persistent organic chemicals in a multimedia environment as related to environmental risk analysis.

Robert J. Blendon, MBA, MPH, ScD; Professor of Health Policy and Management. Politics of health care; access to health care; approaches to health care reform; influence of public opinion in shaping health policy.

Susanne J. Goldie, MD, MPH; Assistant Professor of Health Decision Science. Development of disease-specific transition models; quality-of-life assessment; cost-effectiveness analysis of preventive interventions.

John D. Graham, AM, PhD; Professor of Policy and Decision Sciences. Environmental protection; prevention of intentional and accidental injury.

George M. Gray, MS, PhD; Lecturer on Risk Analysis. Risk characterization to inform policy decisions; risk assessment and right-to-know; food safety.

James K. Hammitt, SM, MPP, PhD; Associate Professor of Economics and Decision Sciences. Mathematical modeling and analysis of economic behavior and decision making under uncertainty.

David Hemenway, AM, PhD; Professor of Health Policy. Intentional and unintentional injury; health care economics.

William C. Hsiao, MPA, PhD; K.T. Li Professor of Economics. Health care systems; control of health care costs; universal insurance coverage.

Nancy M. Kane, MBA, DBA; Lecturer on Management. Financial strategies of health care organizations; provider behavior under third-party payment systems.

Jack Kasten, MPH, JD; Lecturer on Health Services. Managed care; service utilization; manpower issues; hospital organization and management.

Karen M. Kuntz, SM, SD; Associate Professor of Health Decision Science. Cost-effectiveness analysis of cancer-screening strategies and development of disease-specific multiattribute utility scales.

Jonathan I. Levy, SD; Assistant Professor of Environmental Health and Risk Assessment. Estimation of health effects of air pollution, using both health metrics and monetary valuations; public health benefits of energy conservation.

Leonard J. Marcus, MSW, PhD; Lecturer on Public Health Practice. Negotiation, conflict resolution, and use of mediation in health care settings; effects of conflict on health care decision making and outcomes.

Michelle M. Mello, MPhil, PhD, JD; Assistant Professor of Health Policy and Law. Bioethics; managed care; medicare; politics of health care reform; legal issues in the regulation of health care providers.

Jack Needleman, MA, PhD; Assistant Professor of Economics and Health Policy. Health economics and policy; econometrics; research design and evaluation; applied policy analysis; management of the policy process; hospital finance.

Peter J. Neumann, MA, SD; Assistant Professor of Policy and Decision Sciences. Cost-effectiveness analysis in health and medicine; pharmacoeconomics; medical technology assessment; and government policy on pharmaceuticals and medical technology.

Joseph P. Newhouse, PhD; John D. MacArthur Professor of Health Policy and Management. Financing and organization of medical care; medical malpractice; manpower policy; outcome research.

R. Heather Palmer, MB, BCh, SM; Professor of Health Policy and Management. Quality of health care; incorporation of evaluation measures into health care reform plans.

Deborah B. Prothrow-Stith, MD; Professor of Public Health Practice and Associate Dean for Faculty Development. Community-based violence prevention; violence prevention protocols for primary care settings.

Marc J. Roberts, PhD; Professor of Political Economy. Health policy; environmental policy; ethical aspects of allocating scarce public health resources.

Meredith Rosenthal, PhD; Assistant Professor of Health Economics and Policy. Empirical studies of the impact of financial incentives and organization on physician behavior; econometric models of health care provider behavior.

David M. Studdert, LLB, MPH, SD; Assistant Professor of Health Policy and Law. Medical malpractice and quality of care; health law and regulation; dispute resolution; injury and disability policy; medical ethics.

Katherine Swartz, MS, PhD; Professor of Health Policy and Management. Populations without health insurance; financing of universal health insurance; structures of financial incentives for physicians.

Kimberly M. Thompson, MS, SD; Assistant Professor of Risk Analysis and Decision Science. Analysis of the risks, costs, and benefits of using airbags as lifesaving devices; applications of value of information (VOI) techniques to environmental health decisions.

Nancy Turnbull, MBA. Lecturer on Health Policy and Management. Health insurance regulation; health care access; international applications of managed care.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Cost-effectiveness of health practices and technologies.

Secondary Appointments

(primary appointments at Harvard Medical School)

David W. Bates, MD, SM; Associate Professor in the Department of Health Policy and Management. Clinical decision making and physician behavior; quality of care and cost-effectiveness; outcome assessment.

Donald M. Berwick, MPP, MD; Associate Professor in the Department of Health Policy and Management. Health care quality assessment, management, and improvement; technology assessment and cost-effectiveness analysis; decision analysis and clinical epidemiology.

Troyen A. Brennan, MA, JD, MPH, MD; Professor in the Department of Health Policy and Management. Medical ethics; personal injury and environmental litigation; medical malpractice and health policy reform.

Paul H. Campbell, MPA, SD; Lecturer on Management. Financial management, strategic planning, and reimbursement systems; health services in developing countries.

David J. Cohen, MD, SM; Associate Professor in the Department of Health Policy and Management. Application of health outcomes research and cost-effectiveness analysis to interventional cardiology.

Craig C. Earle, MD MSc; Assistant Professor in the Department of Health Policy and Management. Clinical epidemiology; economic evaluation; quality assessment.

G. Scott Gazelle, MD, MPH, PhD; Associate Professor in the Department of Health Policy and Management. Technology assessment; health services research.

Robert A. Greenes, MD, PhD; Professor in the Department of Health Policy and Management. Medical informatics; design and development of a modular approach to knowledge management; facilitating integration of the work of multiple contributors.

Richard C. Hermann, MD, SM; Assistant Professor in the Department of Health Policy and Management. Variation and appropriateness of mental health practices; quality assessment and improvement of mental health care.

Thomas H. Lee, Jr., MD, SM; Associate Professor in the Department of Health Policy and Management. Prognostic stratification in and cost-effectiveness analysis of cardiovascular disease management.

Matthew H. Liang, MD, MPH; Professor in the Department of Health Policy and Management. Epidemiology of rheumatic disease and disability; clinimetrics; health services research; technology assessment.

Tracy A. Lieu, MD, MPH; Associate Professor in the Department of Health Policy and Management. Children's primary care delivery and outcomes; cost-effectiveness analysis.

Jane C. Weeks, MD, SM; Associate Professor in the Department of Health Policy and Management. Outcomes of cancer treatment; effectiveness of resource utilization in medical oncology; medical decision making in oncology.

Adjunct Faculty

Donald S. Bialek, MD, SM, MPH. Consultant.

Angela Browne, PhD. Soros Institute of Peace.

David E. Burmaster, MPP, PhD. Alecon, Cambridge, MA.

S. Philip Caper, MS, MD. Codman Research Group, Inc.

Gail Charnley, PhD. Energy Resources Company, Cambridge, MA.

Karl P. Claxton, MSc, DPhil. University of York.

Mark G. Field, AM, PhD. Boston University.

Kenneth A. Freedberg, MD, SM. Boston University School of Public Health.

Pamela S. Green, JD. Consultant.

Sheldon Greenfield, MD. Tufts University.

Amy A. Harbaugh, MBA. Community Health Center Capital Fund, Boston.

Maria G. M. Hunink, MD, PhD. Erasmus University Medical School, the Netherlands.

Andrew L. Hyams, JD, MPH. Urban Health Institute, Boston Department of Health and Hospitals.

Sherrie H. Kaplan, MPH, MSPH, MS, PhD. Tufts University School of Medicine.

Christian M. Koeck, MD, MPH, SM, SD. Vienna City Hospital Association.

Zita Lazzarini, MPH, JD. Adjunct Assistant Professor of Law and Public Health.

Lucian L. Leape, MD.

Bengt Liljas, PhL, PhD. Medical and Scientific Affairs, Astra Pharmaceuticals and AstraZeneca.

Eugene Litvak, MS, PhD. Boston University School of Public Health.

Ragnar E. Losfstedt , MA, PhD. Surrey University.

George D. Lundberg II, MD, MS, ScD. Medscape.

John E. McDonough, MPH, PhD. Institute for Health Policy, Brandeis University.

Daniel D. Moriarty, MBA. Office of the Provost, Harvard University..

George B. Moseley III, MBA, JD. University Seminar Center.

Benjamin W. Moulton, MPH, JD. American Society of Law, Medicine, and Ethics.

Jeremy J. Nobel, MD, MPH, SM. GTE Laboratories.

Alice A. Noble, JD, MPH. Attorney at law in private practice.

John A. Norris, JD, MBA. John A. Norris Esquire, PC.

Joseph S. Pliskin, SM, PhD. Ben-Gurion University.

Dorothy E. Puhy, MBA. Dana-Farber Cancer Institute.

Lorenz R. Rhomberg, PhD. Gradient Corporation.

Howard Rivenson, MBA.

Richard B. Siegrist, Jr., MS, MBA. Transition Systems, Inc.

Glenn K. Wasek, SM. John Snow, Inc.

Department of Immunology & Infectious Diseases

The Department of Immunology and Infectious Diseases focuses on the biological, immunological, epidemiological, and ecological aspects of viral, bacterial, protozoan, and helminthic diseases of animals and humans and the vectors that transmit some of these infectious agents.

Research in the department emphasizes basic pathogenic mechanisms that may lead to better diagnostic tools, the development of vaccines and other interventions for prevention and control of infection and disease, and the identification of new targets for antiviral and antiparasitic drugs. Laboratory-based research within the school may be supplemented by field-based studies of epidemiological and ecological aspects of infectious disease transmission and control. Diseases of developing countries are emphasized.

Members of the department take a multidisciplinary approach that includes immunology, molecular biology, public health entomology, cell biology and ultrastructure, biochemistry, pathology, virology, epidemiology, and ecology. The faculty undertakes research both within the school and around the world.

Infectious diseases currently under study include protozoa (malaria, leishmania, ameba, giardia), helminths (schistosomes, filaria, onchocerca), viruses (HIVs, leukemia retroviruses, West Nile and eastern equine encephalitis), and bacteria (Lyme disease agents, ehrlichia, tuberculosis). Further immunologic studies focus on genetic regulation of the immune response, molecular mechanisms of the regulation of class II genes, the function and regulation of T-cell-derived cytokines, and cytokines involved in the regulation of inflammation.

Degree Programs in Immunology and Infectious Diseases

As described below, the department offers doctor of science (SD) and doctor of philosophy (PhD) degree programs. No master of science programs are currently available.

Students in both programs choose among the areas of interest described below:

Immunology The curriculum currently focuses on genetic regulation of the immune response, molecular mechanisms of the regulation of class II genes, and the function and regulation of T-cell-derived cytokines. Students take courses in cell biology, immunology, and molecular immunology.

Immunology and molecular biology of parasitic and other infections This area of interest introduces students to recent advances in the biology of parasitic and infectious diseases and provides background for conducting research on these diseases. The program emphasizes molecular biology, immunology, cell biology, and the epidemiology of parasites.

Infectious disease epidemiology and tropical public health This area of interest provides a solid understanding of epidemiology, ecology, and control of infectious diseases in developing countries. It emphasizes control and prevention measures and the biological basis of diseases caused by pathogens that range from viruses to parasites.

Vector biology, ecology, and control This area of interest focuses on the manner in which blood-feeding arthropods interact with their various vertebrate hosts and with the human pathogens that they transmit. These interests combine biological experimentation, epidemiological analysis, and population studies. Students become familiar with the various arthropods that are associated with human disease and learn the ways environmental change may result in ill health. Students conduct studies on mechanisms of transmission of vector-borne pathogens, both in the laboratory and in the field, and devise novel intervention strategies.

IRENE KOULINSKA

Doctoral student, Department of Immunology and Infectious Diseases

Born in Bulgaria, Irene Koulinska lived in Mozambique from the time that she was three years old until she came to HSPH. She is a physician, having earned an MD at Eduardo Mondlane University in 1998.

"While I was in medical school," Koulinska says, "the HIV epidemic in Mozambique was growing, and I saw many HIV-infected patients in the hospital." She knew that she would do something to help ease the AIDS burden but didn't know if it would be through clinical work or research. Then she met some HIV researchers who suggested she apply for a one-year fellowship to HSPH. She did.

One year, however, wasn't enough. The fellowship year was dedicated to research training—Koulinska wanted to go beyond these technical skills and be better prepared to design and conduct her own research projects. After careful consideration she entered the doctoral program.

Koulinska's research concerns the genetic characterization of HIV viruses as found in infants in Tanzania; she is part of a team investigating HIV in a large cohort of mothers and their children in that country. In the future Koulinska wants to continue her research on the AIDS epidemic in Africa, in addition to providing clinical services. Wherever possible, she would like to foster collaborations between African health institutions and those in Europe or North America.

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Biology, Epidemiology, Economics, and Policy: Malaria

Ecology, Epidemiology, and Control of Important Parasitic Diseases of Developing Areas

Tuberculosis: The Host, the Organism, and the Global Threat

Survey of Immunology

Principles of Public Health Entomology

Immunology of Infectious Diseases

Cellular and Molecular Biology of Parasites

AIDS Epidemic: Status, Dynamics, Prospects, Conflicts

Design and Development of a Vaccine

Independent Study, Field Experience

Virology This area of interest is designed to prepare a future generation of experts for new developments in the pathogenesis and prevention of AIDS and other infectious diseases. At present the program emphasizes the epidemiology, biology, and vaccinology of AIDS as an example of a complex infectious disease. Students take courses in virology, vaccine development, and related fields.

Doctor of Science in Immunology and Infectious Diseases

The SD program is designed for those interested in immunology, molecular biology, virology, and epidemiology of infectious diseases. The program prepares students for postdoctoral research fellowships; junior faculty positions at academic institutions; and positions in independent research institutions, governmental agencies, and the biotechnology industry.

Applicants to the SD program should have a clinical degree (MD, DVM, DMD, or equivalent). This program is also available to candidates without a clinical degree who wish to apply to the interdisciplinary concentration in the epidemiology of infectious disease. To enter the program through the Department of Immunology and Infectious Diseases, candidates must have adequate background in modern biology, including microbiology.

This program aims to develop the basic skills in laboratory techniques and data handling necessary for undertaking original research. Course work during the first one or two years emphasizes cellular and molecular biology, virology, immunology, and genetics. Course work for students focusing on the epidemiology of infections also emphasizes epidemiology, biostatistics, and ecology. Electives are chosen according to a student's needs and interests. Courses may be taken at Harvard Medical School, the Graduate School of Arts and Sciences, and MIT, as well as at HSPH.

Students are encouraged to participate in the numerous seminar series and informal discussion groups offered on the Longwood campus. The department emphasizes publication of research results in the standard research literature, and most doctoral students publish several papers before completing the degree. The doctoral thesis is based on intensive laboratory research under the guidance of a faculty adviser in the student's area of interest. Students choose a faculty adviser whose research interests match their own when beginning to research their thesis topic. For information about schoolwide requirements for doctoral degrees, see page 59.

Limited funding is available to qualified SD students who are U.S. citizens or permanent residents. A training grant from the NIH Fogarty Institute also provides some support for international students.

Doctor of Philosophy in Biological Sciences in Public Health (Immunology and Infectious Diseases)

Students wishing to study cellular and molecular biology, immunology, virology, or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

The PhD program is designed to train scientists in state-of-the-art concepts and methods in immunology, immune system disorders, virology, the biology of parasites, or important infectious diseases. Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants are required to take both the GRE general and subject tests; these must be taken in time to meet the application deadline of December 16, 2002. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The PhD program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in this program engage in laboratory rotations in three different research areas to enable them to assess realistically their interest in a thesis project and to evaluate the suitability of the laboratory and the mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended before the granting of the PhD.

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, at least one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

RELATED OFFERINGS

Interdisciplinary concentration in the epidemiology of infectious disease, see page 57.

CONTACT INFORMATION

For more information about the SD program in immunology and infectious diseases or other departmental inquiries, please contact the assistant to the chair, Department of Immunology and Infectious Diseases, 651 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0975
Fax: 617-739-8348
Web: http://www.hsph.harvard.edu/Academics/iid/index.html

For the PhD program on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4470
Fax: 617-432-4033
E-mail: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/bph

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Myron (Max) Essex, DVM, PhD; John LaPorte Given Professor of Infectious Diseases. Role of retroviruses as infectious agents in AIDS; mechanisms of immunosuppression by retroviruses; African HIVs.

Barry R. Bloom, PhD; Professor of Immunology and Infectious Diseases and Dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases, particularly tuberculosis and leprosy; genetic analysis of host resistance; genetically engineered vaccines against tuberculosis.

Barbara Burleigh, PhD; Assistant Professor of Immunology and Infectious Diseases. Molecular and cellular basis of *Trypanosoma cruzi*–host cell interactions; host cell invasion; signal transduction; *Trypanosoma cruzi* differentiation.

Manoj T. Duraisingh, MSc, PhD. Molecular basis of the mechanisms underlying the pathogenesis of *Plasmodium falciparum* malaria. Devising vaccine and drug strategies for control of the disease.

Laurie H. Glimcher, MD; Irene Heinz Given Professor of Immunology. Genetic regulation of the immune response; the role of 1a (class II) major histocompatibility complex molecules and T-cell receptor proteins in T-lymphocyte activation.

Michael J. Grusby, PhD; Associate Professor of Molecular Immunology. Molecular/genetic analysis of cytotoxic T-lymphocyte-mediated lysis; in vivo models of immune deficiency by homologous recombination in embryonic stem cells.

Donald A. Harn, Jr., AM, PhD; Professor of Tropical Public Health. Regulation or direction of immune responses due to molecular composition of particular antigens; synthetic peptide and DNA vaccines for parasitic diseases.

Phyllis J. Kanki, DVM, SD; Professor of Immunology and Infectious Diseases. Pathobiology of human and simian retroviruses; characterization of the immune response to various viral antigens and their correlation to stage of infection or disease.

Igor Kramnik, MD, PhD; Assistant Professor of Immunology and Infectious Diseases. Immunology and immunogenetics of infectious diseases; diagnostic tools for predicting the susceptibility to tuberculosis in experimental models and human populations.

Tun-Hou Lee, SM, SD; Professor of Virology. Virology of human immunodeficiency viruses; design of an HIV vaccine.

Eric J. Rubin, MD, PhD; Assistant Professor of Immunology and Infectious Diseases. Virulence factors of mycobacteria; acquisition of virulence determinants by *Vibrio cholerae*; generalized transposon mutagenesis systems for bacteria.

John C. Samuelson, MD, PhD; Associate Professor of Tropical Public Health. Use of molecular biological and biochemical technique to study *Entamoeba histolytica,* the protozoan parasite causing amebic dysentery.

Andrew Spielman, ScD; Professor of Tropical Public Health. Epidemiology of vector-borne disease; physiology and ecology of mosquitoes and ticks; development of infectivity of pathogens in mosquitoes and ticks.

Ali A. Sultan, MB, BS, PhD; Assistant Professor of Immunology and Infectious Diseases. Biochemistry and molecular pathogenesis of parasites.

Dyann F. Wirth, PhD; Professor of Infectious Diseases. Mechanisms of drug resistance in malaria, including molecular genetic analysis and field-based studies; genetic analysis of malaria transmission; analysis of gene expression.

Secondary Appointments

(primary appointments at Harvard Medical School)

Marcia B. Goldberg, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Characterization of the molecular mechanism and function of unipolar localization of *Shigella* IcsA; mechanism of actin assembly by *Shigella* IcsA.

Donald A. Goldmann, MD; Professor in the Department of Immunology and Infectious Diseases. Epidemiology of nosocomial infections; epidemiologic approaches to medical outcomes assessment and hospital quality improvement.

Martin S. Hirsch, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis and therapy of human retrovirus and herpes virus infections.

I-Cheng Ho, MD, PhD; Assistant Professor of Immunology and Infectious Diseases. Molecular regulation and differentiation of GATA-3; expression of sPLA2 in the differentiation of T-cells.

Kenneth McIntosh, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis, prevention, and treatment of pediatric respiratory viral diseases; coronaviruses; new methods in viral diagnosis; epidemiology and pathogenesis of respiratory infections.

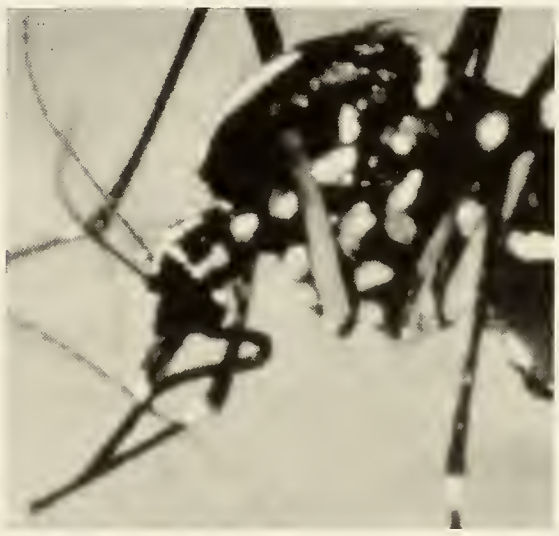
Joseph G. Sodroski, MD; Professor in the Department of Immunology and Infectious Diseases. Role of the HIV-1 envelope glycoproteins in virus entry; topological and structural analysis of the HIV-1 envelope glycoproteins; generation of HIV-1 neutralizing antibodies.

Adjunct Faculty

Kenneth H. Mayer, MD. Brown University School of Medicine.

Thomas P.C. Monath, MD. Vice President, Research and Medical Affairs, Acambis, Inc., Cambridge, MA.

Charles Shoemaker, PhD. Adjunct Associate Professor of Immunology and Infectious Diseases.



Department of Maternal & Child Health

The goal of the Department of Maternal and Child Health is to improve the health of women and children through basic and applied research, through preparation of professionals for leadership positions, and through advocacy and community service.

Faculty members in the Department of Maternal and Child Health (MCH) undertake research in eight major areas: the prevention of infant mortality and morbidity (including risk factors for adverse outcomes of pregnancy, management of childbirth, and its effect on both the course of labor and neonatal outcomes); growth and nutrition (including dietary assessment methodologies for women and children, the assessment and management of toxic-substance exposures, and the impact of nutrition education interventions for low-income women in the postpartum period); children with special care needs, their identification, and the medical and educational services designed to meet these needs; adolescent health (including the origins of psychiatric morbidity, delinquency, violence, and substance abuse); women's mental health, the victimization of women, and the origins and effects of wife and child abuse; determinants of contraceptive utilization; the organization of reproductive health services in the context of health-sector reform in developing countries; the organization of health services (including studies of the planning, policy development, and performance of federal, state, and local public and private health agencies) and the evaluation of managed care and public health interventions like Healthy Start on the use of health services by women and children in the United States.

The department's academic curriculum includes courses on maternal and child health problems of public health significance; the physical, social, and cognitive stages of human development; women and health; maternal and child health services; the roles of governmental, private, and voluntary health agencies; research methods; and the methodology of program planning, policy formation, and program evaluation in maternal and child health.

Degree Programs in Maternal and Child Health

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, a dual-degree master's program for nurses, and a doctoral program leading to the doctor of science (SD) or doctor of public health (DPH) degree.

Students focusing on maternal and child health are expected to acquire an understanding of normative growth and development, definition and research in maternal and child health problems, maternal and child health services, legislation supporting health and social services for mothers and children, and the planning of such services.

A limited number of tuition fellowships for health professionals in the 40-credit master's degree programs (SM, MPH) and for doctoral students are available through a federally funded training grant from the Maternal and Child Health Bureau (HRSA-HHS). These traineeships require U.S. citizenship or permanent residency. Additional limited tuition support may be available for other master's and doctoral students.

For information on schoolwide requirements for master's and doctoral degrees, see page 59.

Master of Science in Maternal and Child Health (80-credit and 40-credit programs)

The 80-credit, professional SM program is designed to prepare students for midlevel positions as project analysts, service coordinators, and managers in the field of maternal and child health. Recent graduates have taken such positions as associate director of Campaign

for Our Children and training coordinator for the HIV Prevention Training Center.

The 40-credit SM program is intended to provide preparation for research careers in public and private agencies. Recent graduates have taken such positions as director of adolescent medicine at New England Medical Center, associate director of public health and research at Georgetown University, and assistant medical director of the Rhode Island Health Department; others have gone on to earn doctoral degrees.

Applicants to the 80-credit program should have either a master's degree in a field not directly related to health (such as law, education, sociology, or statistics) or a bachelor's degree in a health-related field and at least two years of relevant work experience.

Applicants eligible for the 40-credit program are established practitioners or investigators holding prior master's or doctoral degrees in a related field such as medicine, dentistry, nursing, social work, nutrition, physical therapy, psychology, health education, or anthropology.

For the 80-credit program, in addition to the schoolwide requirements, students must earn at least 30 credits in departmental courses or approved courses in other departments. A minimum of 5 credits must be earned in fieldwork either during the summer between the two years or in the second academic year.

For the 40-credit program students must fulfill core requirements and must earn 20 credits in the Department of Maternal and Child Health or in approved courses from other departments.

Quantitative and evaluation methods

Students in the 40-credit SM program may choose to focus on a special area of interest: quantitative and evaluation methods. This area of interest is designed to prepare health professionals for work in public and private agencies and places emphasis on quantitative methods, program evaluation, analysis of administrative data sets, and applied epidemiology. Graduating students in this area typically take positions as program evaluators/epidemiologists for MCH agencies.

In addition to the regular requirements, this specialization includes an eight-week internship during the spring semester in an applied MCH setting, with placements typically at the Centers for Disease Control and Prevention or in state or local MCH agencies. The specialization also requires course work on screening, needs assessment, and program evaluation. The standard duration is twelve months, with course work beginning during the summer prior to the academic year; however, an accelerated nine-month program is also available.

Master of Science in Maternal and Child Health (HSPH 40-credit program) and Parent-Child Nursing (Simmons College 40-credit program)

This professional, dual-degree program, which requires that 40 credits be earned at HSPH and 40 at Simmons, is designed to prepare nurse practitioners for leadership roles in child, youth, women's, or school health programs. Recent graduates have taken such positions as director of clinical services for the Family Planning Association of Maine and staff director for the World Health Organization's Maternal Health and Safe Motherhood Program.

Applicants should hold a bachelor's degree from a program accredited by the National League for Nursing, a license to practice nursing, and the equivalent of at least three years of full-time nursing experience. International nurses with equivalent backgrounds are eligible to apply. Applicants must meet the general admission requirements of both HSPH and Simmons College.

Students enroll in half-time study at both Simmons College and HSPH for two academic years, in addition to studying at Simmons for one summer session. The curriculum of the HSPH portion of the program is the same as that for the 40-credit SM program. Continued matriculation is dependent on maintaining satisfactory academic progress in both programs.

Doctor of Science in Maternal and Child Health/Doctor of Public Health

The doctoral programs are designed to prepare public health professionals for research careers in academic institutions, public and private health agencies, and leadership roles in national and international organizations. Recent graduates have taken such positions as scientist/study director at the National Academy of Sciences and faculty positions in universities.

Applicants must have an advanced degree in a health field related to maternal and child health. They are expected to have a sound academic record with documented proficiency in the quantitative sciences, relevant work experience, and research interest in an area consonant with the goals of the department. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

LAURIE MARTIN

Doctoral student, Department of Maternal and Child Health

Laurie Martin's career in public health was well launched before she arrived at HSPH. She interned at the Boston Public Health Commission on a childhood immunization program, then worked for the U.S. Army as a data manager for the Family Violence and Trauma Project. Ultimately, she says, "I realized that the projects I was interested in were all related to maternal and child health. I came back to school to both strengthen my research skills and learn more about the field so that I could better serve maternal and child health populations."

One of the highlights of Martin's time at HSPH has been the opportunity to work with the National Collaborative Perinatal Project dataset, a huge repository of information on subjects who have been followed from birth to adulthood. Her thesis examines cognitive ability at age seven, as measured by IQ, as a predictor of adult health. She finds that individuals with a higher IQ at age seven are less likely to have an illness in adulthood.

Following graduation Martin will do a postdoctoral fellowship at HSPH and will continue her involvement in a new study of the tiered-rate reimbursement system for the Massachusetts Office of Childcare Services. "I want to merge the worlds of research, programs, and policy," she says.

RELATED OFFERINGS

Interdisciplinary concentration in women, gender, and health, see page 57.

MPH concentration in family and community health, see page 54.

CONTACT INFORMATION

For more information about research and training in maternal and child health, please contact Patricia Lavoie, Department of Maternal and Child Health, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3762
Fax: 617-432-3755
E-mail: tlavoie@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/mch/ index. html

For more information about the Simmons College component of the dual-degree program, please call 617-521-2141.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Public Health Practice in Maternal and Child Health

Physical Growth and Development I and II

Analysis of Secondary Data

Maternal and Child Health Issues, Programs, and Policies

Maternal and Child Health in Developing Countries

Nutrition in Child Growth and Development

Adolescent Health

Services for Children with Disabilities

Personality and Cognitive Development: Application to Public Health

Women, Health, and Development

Developmental Disabilities I: Evaluation, Assessment, and Systems

Developmental Disabilities II: Value, Policy, and Change

Childbirth: Health Policy and Epidemiology

Research Methods in Maternal and Child Health

Society and Its Effects on Child Health

Social Services for Children, Adolescents, and Families

Child and Adolescent Mental Disorders: Public Health Perspective

Gender-based Violence: Origins and Remedies

Child Abuse and Neglect: Public Health Perspectives

Family Violence and Health on the Reservation

Public Health Genetics: Contemporary Issues and Challenges

Maternal and Child Health Doctoral Seminar

Oral Health Policy

Leadership in Minority Health Policy

Issues in Minority Health Policy

Clinical Effectiveness Seminar

Infant Assessment in the Context of Prenatal Exposures

Independent Study, Field Experience

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Marie C. McCormick, MD, ScD; Sumner and Esther Feldberg Professor of Maternal and Child Health. Infant mortality; outcomes of high-risk neonates and interventions to ameliorate adverse outcomes.

Iain W. Aitken, MB, BChir, MPH; Lecturer on Maternal and Child Health. Maternal health care; management of primary health care workers; design and financing of urban health care systems in developing countries.

Mary Jean Brown, SM, SD; Assistant Professor of Maternal and Child Health. Housing factors, particularly lead poisoning, and their impact on children's health.

Stephen L. Buka, SM, SM, SD; Associate Professor of Maternal and Child Health and Epidemiology. Causes and prevention of behavioral and developmental disorders of children.

Felton J. Earls, MD; Professor of Human Behavior and Development. Longitudinal research to understand how community, family, and individual factors influence delinquent and criminal behavior.

Michael L. Ganz, MS, MPhil, PhD; Assistant Professor of Maternal and Child Health. Relationship between socioeconomic factors, behaviors, ecologic factors, and maternal and child health measures.

Laura A. McCloskey, PhD; Associate Professor of Maternal and Child Health. Origins and sequelae of wife and child abuse; family origins of child psychopathology; women's mental health and victimization; posttraumatic stress.

Karen E. Peterson, RD, SD; Associate Professor of Nutrition. Epidemiology of malnutrition in industrialized and developing countries.

Rima E. Rudd, MSPH, ScD; Lecturer on Health Education. Public health and adult education pedagogy; normative change and change strategies, including small-group communications, community organizing, and social marketing.

Kimberly M. Thompson, MS, SD; Assistant Professor of Risk Analysis and Decision Science. Analysis of the risks, costs, and benefits of using airbags as lifesaving devices; applications of value of information (VOI) techniques to environmental health decisions.

Secondary Appointments

(primary appointments at Harvard Medical School)

Allen C. Crocker, MD; Associate Professor in the Department of Maternal and Child Health. Chronic illness and developmental disabilities in children; mechanisms of disability.

Barbara Gottlieb, MD, MPH; Assistant Professor in the Department of Maternal and Child Health. Unintended pregnancy; cervical cancer; minority and community health; HIV risk and prevention; adolescent and school health.

Charles J. Homer, MD, MPH; Associate Professor in the Department of Maternal and Child Health. Application of epidemiologic methods to assess the effectiveness of health care services.

Ellice S. Lieberman, MD, MPH, DPH; Associate Professor in the Department of Maternal and Child Health. Perinatal epidemiology; risk factors for adverse pregnancy outcomes; assessment of new technologies and care practices in obstetrics.

Eli H. Newberger, MD, SM; Lecturer in the Department of Maternal and Child Health. Child abuse and family violence.

Judith S. Palfrey, MD; Professor in the Department of Maternal and Child Health. Development of preschool children; interface of health and educational services for children.

Joan Y. Reede, MD, MPH, SM; Assistant Professor in the Department of Maternal and Child Health. Biomedical manpower and academic/research career development; health services to/impact of health policy on minority and other populations.

Douglas K. Richardson, MD, MBA; Assistant Professor in the Department of Maternal and Child Health. Impact of variations in practice styles on outcomes, resource use, and costs of neonatal intensive care.

Benjamin P. Sachs, MD, BS, MRCS, LRCP, DPH; Professor in the Department of Maternal and Child Health. Epidemiology and health policy relating to women and children in technological evaluation, infant mortality, and medical services.

Edward C. Tronick, MS, PhD; Associate Professor in the Department of Maternal and Child Health. Neurodevelopment of infants and children exposed to drugs in utero; depressive symptoms and mother-infant interaction.

Adjunct Faculty

Robin J. R. Blatt, Dip. Nursing, MPH. Massachusetts Department of Public Health.

Johanna T. Dwyer, SM, SM, SD. Stern Nutrition Center, Tufts Medical Center.

Marie P. Farrell, MS, MSN, EdD, MPH. University of Southern Mississippi.

David T. Helm, MA, PhD. Sociology Department, Boston University; Children's Hospital.

Daniel J. Kindlon, MS, PhD. Pennsylvania State University College of Medicine.

Lawrence C. Kleinman, MD, MPH. Psychologist in private practice.

John W. Kulig, MD, MPH. Tufts University School of Medicine.

Norma M. Swenson, MPH. Consultant.

Lisa Tieszen, MA. Beth Israel Deaconess Medical Center.

Deborah K. Walker, EdM, EdD. Programs and Prevention, Massachusetts Department of Public Health.

Department of Nutrition

The mission of the Department of Nutrition is to improve human health through enhanced nutrition. The department strives to accomplish this goal through research aimed at improved understanding of how diet influences health, the dissemination of new knowledge about nutrition to health professionals and the public, the development of nutritional strategies, and the education of researchers and practitioners.

The Department of Nutrition provides training and research opportunities in basic science relating to nutrition and in epidemiologic aspects of nutrition as they affect public health. Nutrition policy and the evaluation of nutritional interventions are longstanding interests of the department, particularly as they concern the populations of Latin America, Africa, Asia, and the United States. Department research ranges from molecular biology to human studies of cancer and heart disease, including the conduct of population-based intervention trials. Students learn and use the latest techniques in biochemistry, physiology, biostatistics, epidemiology, and related fields. Departmental research, whether basic or applied, is relevant to human health.

Current research covers a wide range of topics, including large prospective studies of dietary factors in relation to heart disease, cancer, diabetes, and ophthalmologic disease; development of methods to assess nutritional status by analysis of body tissue; the interaction of nutritional factors with genetic determinants of disease; the interaction of nutritional factors and infectious agents; nutritional influence on blood pressure; effects of nutrition programs on the mental and physical consequences of malnutrition; nutritional determinants of blood lipid factors; lipoprotein metabolism; molecular mechanisms of diabetes and obesity; regulation of the intra- and intercellular delivery of macromolecular nutrients; and the molecular mechanism leading to atherosclerosis and thrombosis.

Degree Programs in Nutrition

As described below, the department offers two doctoral programs. The first is a program leading to the doctor of science (SD) or doctor of public health (DPH) degree in nutrition, with concentrations in either nutrional epidemiology or public health nutrition. The second is a doctor of philosophy (PhD) program in biological sciences in public health (nutritional biochemistry/cardiovascular biology). Applicants to the PhD program who hold a clinical degree in medicine, veterinary medicine, or dentistry may prefer to follow a different curriculum leading to the SD degree in nutritional biochemistry. This option may be available by special arrangement with the department. No master's degree programs are currently available.

Doctor of Science in Nutrition/Doctor of Public Health

The concentration in nutritional epidemiology or in public health nutrition, leading to the SD or DPH degree, provides rigorous training in epidemiology and biostatistics as well as the biological aspects of nutrition. The overall objective of the nutritional epidemiology program is to enable students to investigate relationships between diet and disease. Students in public health nutrition combine behavioral sciences with biologic and quantitative approaches to design and evaluate nutrition programs, policies, and the dissemination of nutrition research.

Graduates are prepared for careers as research scientists in academic institutions, private-sector organizations, and public health agencies in state, national, and international settings. Recent graduates are now working at universities, research foundations, pharmaceutical companies, the National Cancer Institute, and the American Cancer Society.

Applicants must have a strong background in biology and mathematics. An MD or other professional health-related degree is desirable but not required. Applicants to the DPH program must hold an MPH and a prior doctoral degree.

The doctoral program includes formal course work, a practical research project, a seminar, and a thesis research project. For both concentrations students must complete a major in nutrition and two minors. For the nutritional epidemiology concentration, one minor must be in epidemiology; for the public health nutrition concentration, students complete one minor in quantitative methods (biostatistics or epidemiology) and one minor in a behavioral science relevant to the development of public health programs and policies (for example, health and social behavior or maternal and child health). For more information on schoolwide requirements for doctoral degrees, see page 59.

Admission to a joint program with the Department of Epidemiology requires the approval of both departments, and applicants should contact the Department of Nutrition before making formal application. All students in a joint program with Epidemiology must satisfy the major

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Principles of Nutrition

Science of Human Nutrition

Nutrition Seminars I and II

Advanced Topics in Nutrition I and II

Scientific Writing in Nutrition and Epidemiology

Seminars in Food Science and Technology

Nutritional Problems of Less-Developed Countries

Nutrition and Heart Disease

Research Techniques in Nutritional Biochemistry

Nutritional Epidemiology I and II

Molecular Biology Laboratory Techniques

Nutrition/Health Promotion in the Mass Media

Independent Study, Field Experience

requirements of both departments, complete a minor acceptable to both, and write a thesis on a topic concerning both nutrition and epidemiology.

For the SD and DPH programs, funding may be available through the NIH-supported Training Program in Nutritional Science for students with previous doctoral degrees.

Doctor of Philosophy in Biological Sciences in Public Health (Nutritional Biochemistry/Cardiovascular Biology)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

Some graduates have assumed positions as faculty members and research scientists at medical schools, research institutes, and schools of public health; others have gone on to careers as public health nutritionists in international organizations or federal, state, or local governments. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants to the PhD program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants are required to take both the GRE general and subject tests in time to meet the application deadline of December 16, 2002. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The PhD program in nutritional biochemistry offers rigorous training in biochemistry, cell biology, and metabolism, allowing students to work toward solving nutritional and metabolic problems in the laboratory. Students in cardiovascular biology learn to use cutting-edge technologies from molecular biology, biochemistry, and genetics to critically dissect the mechanisms underlying cardiovascular diseases such as heart attacks, strokes, heart failure, atherosclerosis, and congenital heart disease.

Both areas also offer a firm foundation in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students engage in laboratory rotations in three different research areas to enable them to assess realistically their interests in a thesis project and to evaluate the suitability of the laboratory and the mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended before the granting of the PhD.

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

RUY LOPEZ-RIDAURA

Doctoral student, Department of Nutrition

With degrees in medicine and medical science, Ruy Lopez-Ridaura worked as a staff physician at a hospital in Mexico City for five years. During this time, he says, "I treated many patients with diabetes, some with many complications and difficulties. I became aware of the limitations in the clinical field for treating chronic diseases like diabetes."

Lopez-Ridaura decided to widen his perspective, from treating individuals to working with populations. "I think this perspective will give more answers in terms of understanding risk factors and developing preventive strategies," he says. Using data from the Nurses Health Study and from the Health Professionals Follow-Up Study, he is investigating magnesium consumption as a risk factor for diabetes.

Lopez-Ridaura is concerned that Mexico and other developing countries are experiencing a growing problem with chronic diseases like diabetes. One hypothesis for the cause, he states, is that these countries are experiencing nutritional transition as they modernize and industrialize. Another theory is that Mexicans may be among those populations that have a genetic susceptibility to these kinds of conditions.

Lopez-Ridaura is investigating both possibilities and will continue to do so when he returns to Mexico. "My plan is to divide my time between working again in clinical practice, seeing patients, and conducting epidemiologic research in diabetes and obesity," he says.

RELATED OFFERINGS

Interdisciplinary concentration in molecular epidemiology, see page 57.

MPH concentration in family and community health, see page 54.

Nutrional epidemiology area of interest, Department of Epidemiology, see page 22.

CONTACT INFORMATION

For more information about research and training in nutrition, please contact Kathy McLoughlin, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1851
Fax: 617-432-2435
E-mail: nutrition@hsph.harvard.edu

For the PhD program on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4470
Fax: 617-432-4033
E-mail: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/bph

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair: Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Investigation of dietary factors, using epidemiological methods, in the cause and prevention of cardiovascular and other diseases.

Alberto Ascherio, MD, MPH, DPH; Associate Professor of Nutrition and Epidemiology. Relation of dietary factors to cardiovascular and neurological diseases; nutritional epidemiology of multiple sclerosis and Parkinson's disease.

Hannia Campos, MS, PhD; Associate Professor of Nutrition. Dietary and genetic factors affecting lipoprotein metabolism and heart disease in humans; biochemical markers of dietary intake.

Wafaie W. Fawzi, MB, BS, MPH, SM, DPH; Associate Professor of Nutrition and Epidemiology. Etiologies of infectious diseases with emphasis on dietary and nutritional causes; relationships of dietary factors to disease in pregnancy and childhood.

Gökhan S. Hotamisligil, MD, PhD; Associate Professor of Nutrition. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Frank B. Hu, MD, MPH, PhD; Associate Professor of Nutrition and Epidemiology. Diet and physical activity in relation to cardiovascular disease and type-2 diabetes; role of diet and lifestyle in preventing macrovascular complications in diabetics.

David J. Hunter, MB, BS, MPH, SD; Professor of Epidemiology. Use of biomarkers in epidemiologic studies to resolve questions about disease susceptibility and etiology; cancer; cardiovascular disease; HIV.

Karen E. Peterson, RD, SD; Associate Professor of Nutrition. Nutrition and activity surveillance systems and interventions in low-income, multiethnic populations; methodological issues affecting interpretation of growth and nutrition indicators.

Guy L. Reed III, MS, MD; Associate Professor of Immunology. Elucidation of molecular processes leading to cardiovascular disease and stroke; identification of genetic polymorphisms that alter disease risk.

Eric B. Rimm, SD; Associate Professor of Epidemiology and Nutrition. Relation of diet to diseases, especially obesity, diabetes, and cardiovascular disease; impact of antioxidants, B vitamins, fiber, and alcohol on serum and genetic markers.

Frank M. Sacks, MD; Professor of Cardiovascular Disease Prevention. Human lipoprotein metabolism; effects of diet and hormones; dietary fatty acids and cardiovascular disease.

Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and exogenous hormones on health, particularly heart disease and cancer.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Regulation of the cellular uptake of macromolecular nutrients; molecular basis of iron transport.

Secondary Appointments

(primary appointments at Harvard Medical School)

Christopher P. Duggan, MD, MPH; Assistant Professor in the Department of Nutrition. Oral rehydration solutions for acute diarrhea; nutritional requirements of catabolic patients; micronutrient needs in infectious and critical illness.

Mathew W. Gillman, MD, SM; Associate Professor in the Department of Nutrition. Relationship of diet to chronic conditions and diseases; early-life prevention of adult chronic disease; disease prevention in defined populations.

Edward L. Giovannucci, MD, MPH, SD; Associate Professor in the Departments of Nutrition and Epidemiology. Study of diet and occurrence of cancers, particularly of the colon and prostate.

Clifford W. Lo, MD, MPH, ScD; Assistant Professor in the Department of Nutrition. Vitamin D and calcium nutrition; total parenteral nutrition.

W. Allan Walker, MD; Professor in the Department of Nutrition. Nutrition and developmental gastroenterology; nutrition and mucosal immunology; gastrointestinal immunology; protective functions of breast milk.

Adjunct Faculty

Jeffrey M. Leiden, PhD, MD. Abbott Laboratories.

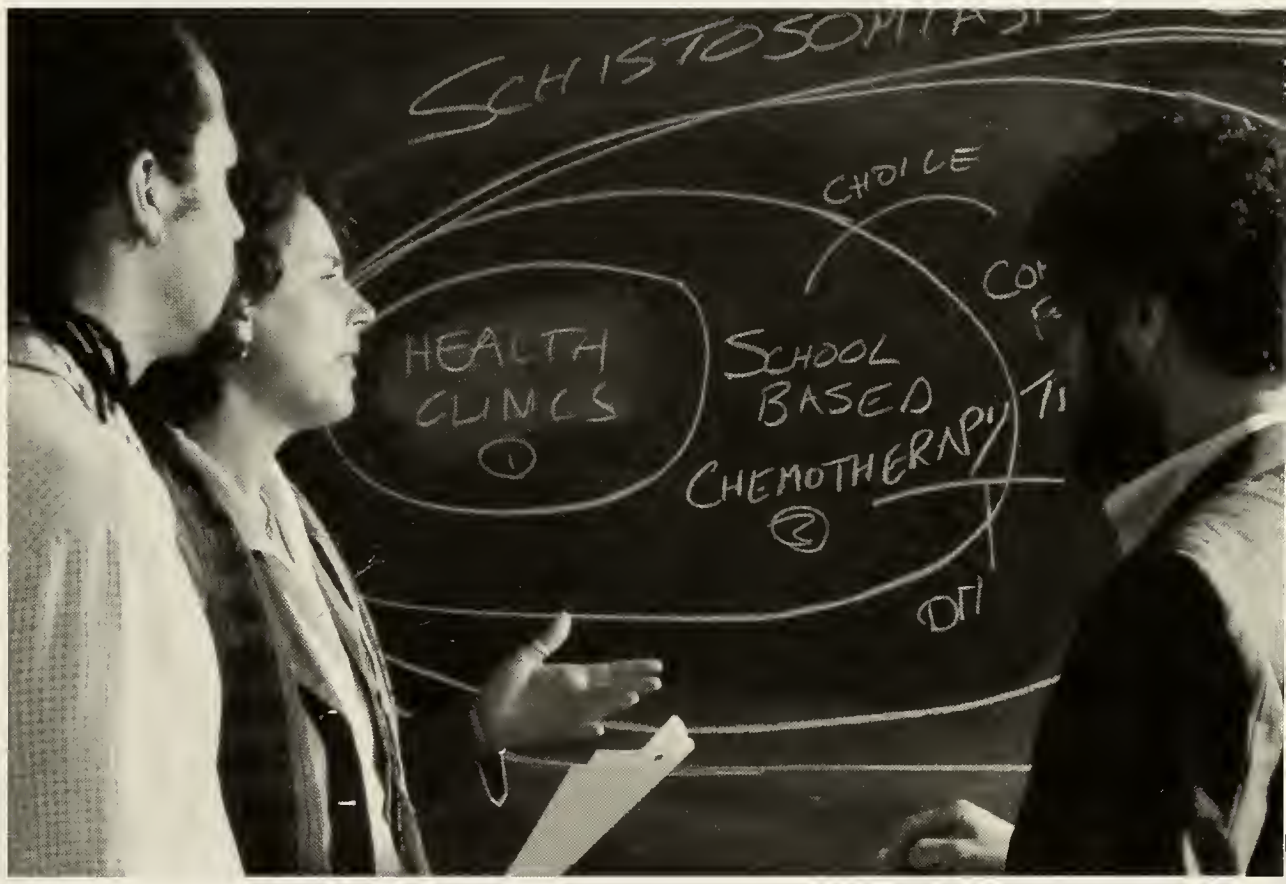
Department of Population & International Health

The Department of Population and International Health seeks to improve global health problems through education, research, and service from a population-based perspective.

The twenty-first century has arrived with complex changes in demographic patterns, disease burdens, and health policies. These changes are affecting all societies, rich and poor, developed and developing. The department's approach to these problems combines the analysis of population and health intersections using quantitative and qualitative methods, the investigation of policies that affect health, and a concern with the political economy of health and development.

The department's members generate knowledge and ideas through their research, strengthen technical and leadership skills through educational programs, and enhance national capacities through collaborative projects, especially in developing countries. Drawing on anthropology, demography, ecology, economics, epidemiology, ethics, medicine, political science, reproductive biology, and sociology, department faculty members apply their disciplinary expertise to population and international health issues. The department's research interests span a wide spectrum of topics, including social and economic development, health policy, and demography; design and financing of health care systems; women's health, reproductive health, and children's health; and prevention and control of infectious and chronic diseases. The department has a special concern with questions of health equity and human rights, particularly in relation to health and population issues in developing countries.

Students in the department come with various backgrounds. Many students are from developing countries. All have an interest in the health of disadvantaged populations worldwide.



Degree Programs in Population and International Health

As described below, the department offers both an 80-credit master of science (SM) program and a program leading to the doctor of science (SD) or doctor of public health (DPH) degree. For information on schoolwide requirements for master's and doctoral degrees, see page 59.

In addition to these programs, the department hosts research fellows and midcareer leaders in international health and in research ethics and undertakes cooperative technical projects overseas.

Master of Science in Population and International Health

The department's SM program offers two tracks, each comprising 80 course credits, geared toward preparing individuals for academic and public service careers, respectively.

Students on the research track generally continue with doctoral work at the end of the master's program; their eventual aim is to work as researchers in academic institutions. Graduates of the professional track pursue a variety of careers in national and international agencies and institutions.

Applicants in both tracks must hold a bachelor's degree or equivalent, although many students already hold advanced degrees in medicine or a social science discipline. The program strongly prefers applicants with relevant work experience in population or international public health.

In both tracks the courses and the thesis work are based on practical aspects of current health and population issues in developing countries and at the same time introduce students to the major theoretical issues in international health and population. In addition to meeting schoolwide requirements (these depend on the track selected), students acquire a grounding in the concepts and tools used for field survey work, experience with data analysis and qualitative research methods, and familiarity with the classic literature in population and international public health.

The first year of study is devoted to full-time course work. During the summer between the first and second years, students are encouraged to gain practical experience by undertaking an internship. The second year generally involves a combination of course work and independent research linked to completion of a required master's thesis, which is usually based on the summer internship experience. The thesis provides an opportunity for the student to bring together the conceptual models and analytic skills presented in the courses and to apply them to a single issue. For students continuing into a doctoral program, the

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are offered in alternate years. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Computer Methods for Demography and International Health

Disaster Management

Complex Humanitarian Emergencies Research

Econometrics for Health Policy

Management Control in Health Organizations

Health, Human Rights, and the International System

Health and Human Rights: Concepts and Methods for Public Health

Development and Human Rights

Fertility Analysis

Epidemiology of the Family

Epidemiology of Infectious Diseases of Public Health Importance in Developing Countries

Biological and Clinical Foundations of Reproductive Health

Family Planning and Sexually Transmitted Infections in Developing Countries

Maternal and Perinatal Health in Developing Countries

Management of Reproductive Health Programs

Health Sector Reform: A Worldwide Perspective

Population and Development Policies: A World of Contention

Evaluation of Health Interventions in Developing Countries

Human Ecology

Business Planning for Health Organizations

New and Resurgent Disease

Frontiers of Knowledge in HIV/AIDS Prevention, Care, and Research

Mathematical Models in Biology and Public Health

Grant Writing for Funding of Research and Health Care Projects

Ethical Issues in International Health Research

HIV/AIDS in Developing Countries: Epidemiology and National Responses

Applied Politics and Economics I and II

Foundations of Global Population and Health I and II

Applied Quantitative Methods I, II, III, and IV

Population Ethics

Complex Systems Approaches Emphasizing Qualitative Mathematics

Research Methods and Biostatistics for International Health

Independent Study, Field Experience

thesis often forms the core of the research proposal for more advanced work.

No concentrations are offered at the master's level.

Doctor of Science in Population and International Health/Doctor of Public Health

The doctoral programs are designed to prepare students both for professional leadership positions in the public or private sectors of public health and for academic careers in universities or research institutions. Recent graduates have taken positions with the Centers for Disease Control and Prevention, the World Bank, and nongovernmental organizations and have assumed postdoctoral and teaching positions with universities in the United States and around the world.

Desired applicants have outstanding academic records, substantial relevant experience in the international public health arena, and professional interests that correspond to one of the department's three doctoral concentrations.

Applicants to the DPH program must hold an MPH and a prior doctoral degree. Though not required for the SD program, a master's degree is strongly recommended. Students are encouraged to enter the department's 80-credit master's degree program and apply to enter the doctoral program at a later date. Entry to the doctoral program will then depend upon outstanding performance in the master's degree program and acceptance through the regular doctoral program admission process.

The first year of the doctoral program is ordinarily devoted to course work. The second year usually involves both course work and research planning. Subsequently additional courses are taken to fulfill remaining requirements and/or to gain special skills related to thesis research. The pace of progress depends largely on the student's individual plan, which is designed in collaboration with an adviser and thesis committee.

The major field must be chosen from one of the concentrations offered by the department, as described below. Minor fields may also be chosen from the department or from allied departments of the school or university, including the Departments of Biostatistics, Epidemiology, Health and Social Behavior, Immunology and Infectious Diseases, Nutrition, or Maternal and Child Health. The departmental concentrations promote skill development, encourage multidisciplinary approaches to health problems, and provide opportunities for extensive linkages in diverse field settings in Africa, Asia, or Latin America.

International health epidemiology and ecology This concentration is designed for students who wish to take a broad, integrated approach to researching health problems and to developing the methods for such study. Students acquire an understanding of health as part of the relationships between people and between humans and nature in the contexts of evolution, environmental change, infectious disease ecology, economic development, and demography. Through this process students gain skills to identify the determinants, consequences, and dynamics of health problems and learn to plan, implement, and evaluate health promotion and disease prevention strategies and programs.

The epidemiologic component of this concentration emphasizes the application of the combination of ecological, population-genetic, and evolutionary theories with qualitative mathematical methods on international patterns of health and disease. The ecological aspect of the curriculum focuses on health aspects of ecology and the inseparability of social and biological aspects of human ecology. Students also acquire in-depth knowledge of a sampling of major disease problems, ecological habitats, and health programs.

International health policy and economics This concentration is designed for students who wish to develop skills and pursue research on health policy in developing countries. The concentration provides a balance of training in politics and economics and the substantive knowledge necessary to carry out doctoral research in the area of international health policy. Students complete required course work in politics, economics, international health, and policy analysis. According to their research interests students may elect to take specialized courses in political economy, the politics of development, comparative politics, international relations, microeconomic theo-

ry, econometrics, cost-effectiveness and cost-benefit analysis, and development economics.

Population and reproductive health

This concentration is designed for students who are interested in the interdisciplinary study of human fertility, health, and mortality and who desire a population-based perspective on the changing patterns of mortality and morbidity worldwide. A core curriculum provides students with the basic skills to measure demographic and health trends and to understand how fertility, mortality, age structure, and reproductive health are inextricably linked. Students become familiar with the global and regional components of reproductive health, its determinants, and consequences. International and local policies, as well as services for promoting family planning, reproductive health, and family health, are examined and their effects evaluated.

The concentration stresses a population-based approach to international health issues. Comparative analysis is used to highlight disparities, similarities, and differences between developed and developing countries' experiences and between different social classes within a single population. There is a strong emphasis on field methods and practical aspects of data collection, analysis, and presentation. Though faculty members are drawn from a variety of disciplinary backgrounds, all have close contact with contemporary population and reproductive health problems in developing countries.

Faculty research in this concentration includes the design and use of qualitative and quantitative methods for the study of reproductive mortality and morbidity; infertility and its determinants and consequences; the fertility transition in poor countries; the design and evaluation of family planning and reproductive health services; gender-based perspectives and differentials in fertility, health, and mortality; intergenerational relations in developing countries; and policy reform following the 1994 Conference on Population and Development.

This concentration has strong regional interests in South and East Asia, sub-Saharan Africa, North Africa, and the Arab world.

CHRISTINE RICARDO

Master's student, Department of Population and International Health

When Christine Ricardo graduated from Wellesley College with dual majors in English and biological sciences, she was already planning to return to school for a graduate degree. First, however, she engaged in public service by working for a nonprofit organization that sought to help urban children improve their academic skills. Then it was time to take the next educational step.

"I wanted to continue in public service," Ricardo says, "so I was looking for a field that would tie into my interests and experiences with science and community service. Public health seemed like a good fit."

Ricardo plans to work with mothers and children in Brazil after she completes her studies. Training in the Department of Population and International Health allows Ricardo "to look at a specific area of health, like maternal and child health, but in an international context."

In the meantime, however, Ricardo is continuing her efforts on behalf of urban children. She applied for and received a Schweitzer Fellowship to work with a community organization in Boston's Jamaica Plain neighborhood. She is creating an afterschool program for boys between nine and twelve years of age that will provide lessons in nutrition, fitness, and stress management. Ricardo also hopes to enlist community men to get involved with the group. "I'm going to be there, interacting with the kids," she says, "but boys at this age often need good male role models. I hope to help them connect with a diverse group of male role models in the greater Boston community."

Bio- and Public Health Mathematics

Several departments offer courses designed to promote research and education in mathematics as applied to scientific problems in public health and medicine. The Committee on Bio- and Public Health Mathematics has compiled a list of courses teaching the development or implementation of mathematical tools in public health research.

Postdoctoral Fellowships

The Department of Population and International Health offers two nondegree postdoctoral fellowship programs.

The Research Ethics Fellowship Program, sponsored by the Fogarty International Center of the National Institutes of Health, provides support for up to two years. Fellows spend the first ten months in residence at the school and develop projects dealing with ethical issues in health research to be completed in their home countries during the second year of the fellowship.

The Takemi Program offers fellowships for professionals and scholars from around the world for research and advanced, interdisciplinary training on critical issues of international health, especially those related to developing countries. The program addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. The program can fund a limited number of fellowships each year and can assist in identifying external sources of funding, which applicants are encouraged to pursue.

RELATED OFFERINGS

MPH concentration in international health, see page 54.

Interdisciplinary concentration in the epidemiology of infectious disease, see page 57.

Interdisciplinary concentration in women, gender, and health, see page 57.

CONTACT INFORMATION

For more information about research and training in population and international health, please contact the Education Office, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2253
Fax: 617-566-0365
E-mail: ajaimung@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/pih/index.html

For more information about courses related to Bio- and Public Health Mathematics, please contact Tamara Awerbuch, PhD, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-2505
Fax: 617-566-0365
E-mail: tamara@hsph.harvard.ed

For more information about the Research Ethics Fellowship Program, please contact Richard A. Cash, MD, MPH, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1076
Fax: 617-566-0365
E-mail: rcash@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/bioethics

For more information about the Takemi Program in International Health, please contact Michael R. Reich, PhD, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0686
Fax: 617-432-1251
E-mail: takemi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/takemi

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2002–03.

Department chair (acting): David E. Bloom, MA, PhD; Clarence James Gamble Professor. Applied microeconomics: labor, population, health, development, and environment; demography.

Iain W. Aitken, MB, BChir, MPH; Lecturer on Maternal and Child Health. Maternal health care; management of primary health care workers; design and financing of urban health care systems in developing countries.

Peter A. Berman, MSc, PhD; Professor of Population and International Health Economics. Health care financing in developing countries; economic assessment of health policies and programs.

Barry R. Bloom, PhD; Professor of Immunology and Infectious Diseases and Dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases in developing countries, particularly tuberculosis and leprosy; genetic analysis of host resistance; development of genetically engineered vaccines against tuberculosis.

Thomas J. Bossert, MA, PhD; Lecturer on International Health Policy. Health policy in developing countries, especially in Latin America, Africa, and Indonesia.

Paul H. Campbell, MPA, SD; Lecturer on Management. Financial management, strategic planning, and reimbursement systems; health services in developing countries.

Richard A. Cash, MD, MPH; Senior Lecturer on International Health. Development of health systems for rural and urban populations in developing countries.

Norman Daniels, MA, PhD; Professor of Ethics and Population Health. Ethics and health care.

Arthur J. Dyck, AM, PhD; Mary B. Saltonstall Professor of Population Ethics. Concepts of human rights, including ethical issues.

Sofia M. Gruskin, JD, SD; Assistant Professor of Health and Human Rights. Health and human rights; gender, reproductive, and sexual health; global implications for the rights of the child to health; links between HIV/AIDS, health, and human rights.

Joseph J. Harrington, AM, PhD; Professor of Environmental Health Engineering. Water resources planning and quality management; environmental monitoring and control systems; applied statistics for modeling; management for tropical disease control.

Allan G. Hill, MA, PhD; Andelot Professor of Demography. Demography of the Middle East and West Africa; impact on mortality of child survival programs; modern contraception and reproductive health.

Saidi H. Kapiga, MD, MPH, SD; Assistant Professor of Reproductive Health. Development and assessment of community-based HIV/STD control programs; development and testing of interventions to reduce perinatal transmission of HIV; determinants of fertility, provision of family-planning services, and cervical cancer.

Ulla M. Larsen, MA, PhD; Associate Professor of Demography. Interface of demography and health; sterility and reproductive health; focus on Africa.

Jennifer Leaning, SM, MD; Professor of International Health. Medical human rights and international law; complex humanitarian emergencies; medical triage in war and disasters; environmental effects of war.

Richard Levins, PhD; John Rock Professor of Population Sciences. Human ecology; viability of populations and environments; special interest in Caribbean region.

Yuanli Liu, MD, MPH, SM, PhD; Assistant Professor of International Health. Equity in health care; health care financing in developing countries; Chinese health care system; interaction of health and social security systems.

Ajay Mahal, MS, PhD; Assistant Professor of International Health Economics. Macro implications of the AIDS epidemic; implications of rationally guided behavior for HIV transmission; impact of decentralization on effectiveness of health services delivery.

Stephen P. Marks, Doctorat d'état; François-Xavier Bagnoud Professor of Health and Human Rights. Human rights and international affairs.

Marc D. Mitchell, MD, MS; Lecturer on International Health. Management of health care programs in developing countries.

M. Omar Rahman, MD, MPH, SD; Associate Professor of Demography and Epidemology. Healthy aging in rural societies; determinants of pregnancy outcomes in developing countries; assessment of adult health status and international comparisons of gender differences.

Michael R. Reich, AM, PhD; Taro Takemi Professor of International Health Policy. Political economy of health and development; health consequences of development policy; health policy in Japan.

Joseph Sevilla, AM, PhD; Assistant Professor of International Health Economics. Effect of health improvements on economic growth and well-being; determinants of child mortality; most effective means of reducing child mortality.

Daniel Wikler, PhD; Professor of Ethics and Population Health. Ethics and health care.

Chi-Man (Winnie) Yip, PhD; Associate Professor of International Health Policy and Economics. Application of economic models and econometric techniques to study of health care policies.

Secondary Appointments

(primary appointments at Harvard Medical School or Kennedy School of Government)

Rosemary Duda, MD, MPH; Associate Professor in the Department of Population and International Health. Estrogen-regulated gene expression and growth inhibition by phytoestrogens in hormone-dependent malignancies.

Sheila Sen Jasanoff, MA, PhD, JD; Professor in the Department of Population and International Health. Comparative study of biotechnology in Britain, Germany, and the United States.

Mary E. Wilson, MD; Associate Professor in the Department of Population and International Health. Infections acquired during travel and residence in tropical and developing countries.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Population and International Health. Biostatistical and demographic methods; women's reproductive health.

Adjunct Faculty

Adetokunbo O. Lucas, MD, SM. Consultant.

Christopher J. L. Murray, MD, DPhil. World Health Organization.

Carla M. Obermeyer, MA, MSc, SD; World Health Organization.

Amartya K. Sen, MA, PhD. Trinity College, Cambridge University.

Interdisciplinary Programs

Master of Public Health Program

The master of public health (MPH) degree is the most widely recognized professional credential for leadership in public health. The program emphasizes active, student-directed learning, problem solving, and the acquisition of skills essential to the practice of public health. The program is organized around seven career-oriented concentrations (see below). In addition to the common core curriculum, each concentration offers specialty electives and a selection of areas of interest, allowing students to explore in depth one or more spheres of particular relevance to their career goals. The concentrations and areas of interest also enable students in the interdisciplinary MPH program to establish a second "home" in one of the school's academic departments, such as Health Policy and Management or Maternal and Child Health.

Coming from all parts of the world, MPH students bring to the program a wide variety of backgrounds and experiences. The majority of these students are health professionals, with a minimum of three to five years of work experience, who are preparing for advancement in their organizations or for transition into new fields. The MPH program is geared toward professionals who hold a doctoral degree in medicine (or foreign degree equivalent), dentistry, veterinary medicine, law, or other fields related to public health (for example, biology, behavioral sciences, natural and social sciences) or a master's degree in nursing. Individuals with a master's degree in a field closely related to public health and at least three years of related work experience may also be considered for admission to the program. Preference is given to applicants with clearly identified career goals relevant to the program and who demonstrate a strong academic background. Those without the required professional training or experience should consider a master of science program.

Students enrolled in MD, DMD, or DDS programs (and some law students already holding an advanced degree) and who have a career interest in public health and/or preventive medicine are also eligible to apply for admission to the MPH program. These students undertake the MPH program while on leave of absence between the third and fourth year of medical or dental school. They receive the MPH degree upon successful completion of both programs and conferral of the doctoral degree. The MPH program serves as a required academic year for residency training in preventive medicine, aerospace medicine, or occupational and environmental medicine.

MPH students are required to complete a minimum of 40 course credits and must fulfill core requirements in the fundamental public health disciplines (see page 59) and a course on the ethical basis of the practice of public health. Within one of the seven concentrations, applicants choose a second tier of recommended or required courses. Beyond the program and concentration requirements, students are encouraged to consult with faculty advisers to choose elective courses

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Ethical Basis of the Practice of Public Health

Practice of Family and Community Health

Practice of Health Care Management

Introduction to the Practice of International Health

Practice of Occupational Health

Practice of Quantitative Methods

Summer MPH Practicum and Culminating Experience

Field Study, Experience

best suited to their needs. Requirements and concentration guidelines are available from the Office for Professional Education.

MPH candidates may complete the requirements for the degree on a full-time or part-time basis (or may change from one status to the other). Full-time students normally complete the program in two consecutive semesters (September through May). Part-time students complete the requirements for the degree over a period of two or three years. Students may elect to begin their course work in July by enrolling in the Summer Session for Public Health Studies; those interested in this option should contact the Office for Professional Education for guidance.

A summer-only MPH program is also available for students in two concentrations: quantitative methods and clinical effectiveness. The program can be completed by taking courses in three consecutive enrollments in the Summer Session for Public Health Studies. Students wishing to apply for the summer MPH in quantitative methods or clinical effectiveness must observe the same admissions deadlines as all MPH degree applicants.

Concentration goals and areas of interest are described below:

Clinical effectiveness Concerned with identifying the most appropriate, ethical, and cost-effective means of providing health care through prevention, early detection, or treatment, the concentration is designed to provide the analytic and quantitative training necessary to evaluate clinical practices.

Major areas of professional interest for concentrators include clinical epidemiology and biostatistics, cost-effectiveness analysis, medical decision analysis, health services research, quality improvement in health care, and measurement of health-related quality of life. The concentration is limited to clinicians enrolled initially in the Summer Program in Clinical Effectiveness.

Physicians are prepared for clinical research responsibilities and for leadership roles in evaluating and improving all aspects of health care delivery. Along with the broad perspective the program offers on general aspects of public health, this training provides a basis for identifying the health policy implications and public health benefits of the results of clinical investigations.

Family and community health This concentration focuses on the promotion of health and the prevention of disease in populations by preparing health professionals with leadership skills in public health. Courses emphasize strategies for establishing health objectives, data collection and analysis, the management of fiscal and manpower resources, consultation, communication, advocacy, and policy formation in the public sector.

Beyond the MPH core requirements students are encouraged to develop expertise in a focus area geared to their professional interests. Areas of interest include maternal and child health, women and health, mental health and substance abuse, community health, and health promotion and disease prevention.

The program prepares students for positions in diverse public health and nonprofit settings, including federal, state, and local government; advocacy groups; voluntary health organizations; and community-based primary care settings in the United States and other countries. Posts filled by program graduates include state health director; medical director of programs for child, adolescent, or women's health; health policy analyst; and health educator. Others have gone on to academic positions.

Health care management This concentration offers training with either a management or a policy focus. In addition to fulfilling the MPH core requirements, students select from clusters of courses to gain depth in their chosen area. Students choosing the management area of interest take courses providing practical management skills, such as finance and financial analysis, operations, marketing, information systems, quality improvement, management of people, and strategy determination. Students selecting the policy focus take courses in health economics, political science, and applied policy in areas like payment systems, insurance, mental health and substance abuse, community health, and health promotion and disease prevention.

Graduates assume leadership positions in health care organizations that provide direct care (such as hospitals, group practices, and home health agencies), those that pay for and/or organize health care (such as governments, health insurers, and health maintenance organizations), and those that supply direct-care providers (such as pharmaceutical companies and biotechnology firms). Program graduates fill many roles—from consultants and staff analysts, to middle-management and executive positions.

International health This concentration enables students to work toward health improvement by taking account of demographic and epidemiologic changes; the organization of health care and evolving patterns of health care demand; new scientific knowledge and technology; and the roles of professionals in policy, law, communications, and advocacy. It also assists them in finding new ways to strengthen national and institutional capacities for health policy making and management. The international health concentration has several areas of professional interest, including international health policy and management; population, reproduction, and child health; infectious disease epidemiology; research and evaluation methods; health promotion; and humanitarian studies. The last area focuses on population support during war, civil conflicts, or disaster and features a three-month summer field placement.

The program is intended to prepare health professionals with prior international health experience for leadership roles in the practice of international health, with a special emphasis on the populations in developing countries. Graduates of the program work in national ministries of health, international organizations, donor aid agencies, private voluntary organizations, research and academic institutions, and the private sector.

Law and public health The course of study introduces lawyers to the science of public health, provides them with skills in analysis of public health problems, and allows them to design a curriculum that will meet their particular interests. Beyond the MPH core require-

ments lawyers are encouraged to develop an area of interest by choosing among clusters of recommended courses in such fields as health care delivery or environmental health.

The concentration is designed to train leaders in the field of public health law. Graduates are prepared for positions in a variety of settings, including work in a health law or environmental section of a law firm; positions in local, state, and federal government; or posts in academia.

Please note that a three-year MPH-JD program may be offered jointly by the School of Public Health and Harvard Law School. Pending approval of the program, students entering the law school in September 2002 would be able to apply for the joint program during their first year and begin work at HSPH in the summer of 2003.

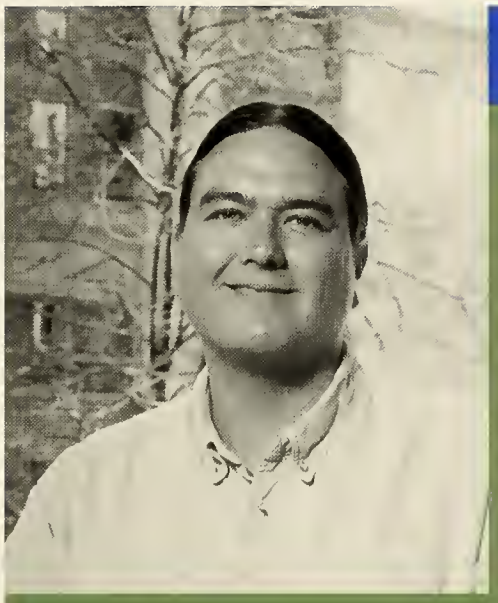
Occupational and environmental health This concentration focuses on workplace and environmental hazards, the physiologic and biomechanical aspects of work, the risks posed by the interaction of genetic and environmental factors, and a practical approach to solving health problems in various work and community settings. The concentration features three areas of interest: occupational/environmental medicine, occupational health, and environmental health.

The program is designed for physicians and other professionals who intend to practice occupational/environmental medicine or to hold responsible positions in occupational and/or environmental policy and management. The occupational/environmental medicine area is intended for physicians who wish to satisfy the requirements of the American Board of Preventive Medicine for certification in occupational and environmental medicine. The requirements for the master of occupational health (MOH) degree are similar to those of the MPH in occupational medicine; physicians may elect either degree.

This concentration also fulfills the first-year requirements of the two-year Occupational and Environmental Medicine Residency.

Quantitative methods The concentration emphasizes study design, data analysis, and the application of quantitative methods to decision making and to research in public health. Beyond the MPH core requirements concentrators must take an additional 2.5 credits of introductory epidemiology and 7.5 credits in intermediate/advanced biostatistics, epidemiology, or decision sciences and an approved practice course in the Spring 2 term. At HSPH and elsewhere within the university, concentrators may choose from advanced quantitative courses that include biostatistics, epidemiology, decision sciences, demography, needs assessment, and evaluation.

The program is geared toward health professionals requiring analytical and statistical skills for successful public health practice and research. It is designed for both midcareer health professionals and those in the early stages of their careers. Program graduates commonly supervise population-based health research in government, health care institutions, and private industry. Many graduates practice in academic medicine.



DON WARNE

Master of public health student

As a primary care physician for the Indian Health Service at a reservation in Arizona, Don Warne was struck by the frequency of diabetes and other behavior-related health problems among his patients. "I realized that treating one patient at a time wasn't going to solve the problem and that the problems really needed to be addressed at the population level," he says.

Warne became a certified diabetes educator, but this approach too had shortcomings: "Most of the diabetes prevention materials and programs are not geared towards life on a reservation," says Warne. Suggested interventions, such as healthier diets and increased physical activity, were difficult to implement within a population that was poor, that depended on relatively unhealthy government-provided foods, and that had been forced to abandon traditional farming and fishing after the damming of a local river.

Warne joined the health care management concentration of the MPH program, with an emphasis on health policy, to get the tools he needs to create effective interventions designed to meet the specific needs of people on the reservation. Following graduation, he says, "I'll be going back and implementing programs that follow a traditional Native American holistic approach, recognizing that diabetes is not just a physiologic problem, but that there are also cultural, spiritual, and emotional components that need to be addressed."

RELATED OFFERINGS

Master of occupational health, see page 15.
Occupational and Environmental Medicine Residency, see page 15.
Summer Program in Clinical Effectiveness, see page 58.
Summer Session for Public Health Studies, see page 58.

CONTACT INFORMATION

For more information about the MPH program or the summer MPH in quantitative methods or clinical effectiveness, please contact Roberta Gianfortoni, director for professional education, Office for Professional Education, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0090
Fax: 617-432-3365
E-mail: rgianfor@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mph

For more information about the MPH-JD program, please contact Michelle Mello, PhD, JD, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0217
Fax: 617-432-4494
E-mail: mmello@hsph.harvard.edu

Other Interdisciplinary Programs

Division of Biological Sciences

The Division of Biological Sciences is an umbrella organization encompassing the HSPH Departments of Cancer Cell Biology, Immunology and Infectious Diseases, Nutrition, and Environmental Health. In most of these departments, two doctoral degrees are offered: the doctor of philosophy (PhD) and the doctor of science (SD). The PhD programs generally center on laboratory-based investigation in the biological sciences, whereas the SD programs emphasize epidemiological analysis. The PhD program is administered by the Division of Biological Sciences.

Doctor of Philosophy in Biological Sciences in Public Health

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD Program in Biological Sciences in Public Health (BPH). This program offers the PhD degree through Harvard University's Graduate School of Arts and Sciences.

The BPH program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. The program also features interdisciplinary training, with students taking courses in several different departments to meet their individual requirements. All students complete core course requirements in biochemistry, cell biology, genetics, microbiology, and physiology and elective courses during their first two years of study. Elective courses cover principles of toxicology, introductory cancer biology, genetic toxicology, cell response to mutagens and carcinogens, human physiology, advanced respiratory physiology, advanced topics in physiology, immunology, cellular and molecular biology of parasites, and the science of human nutrition.

Participating HSPH departments offer PhD programs in the following areas:

- cancer cell biology (radiobiology, toxicology)
- environmental health (physiology)
- immunology and infectious diseases (immunology and molecular biology of parasitic and other infections)
- nutrition (biochemistry, cardiovascular biology)

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Biological Sciences Seminars
Pathophysiology of Human Disease
Frontiers of Cardiovascular Biology
Membrane Trafficking
Independent Study, Laboratory Rotations

These programs are described in the departmental sections of this catalog.

The deadline for applying to the PhD program is December 16, 2002. Please note that Graduate School of Arts and Sciences application forms must be used when applying for this program.

MATT MELLEMA

PhD student, Division of Biological Sciences

Cats are what brought Matt to HSPH. While doing his veterinary medical residency at the University of California, Matt noticed the large numbers of cats who came to the emergency room with severe asthma attacks.

"I started to look into human treatments for asthma to see if there were new therapies that could be applied to cats," says Mellema. He discovered that many aspects of the disease are still not well understood, despite estimates that about 30 million Americans suffer from asthma. The effects on society, he stresses, are powerful: "Because of asthma, there are kids who can't play sports, people clog emergency rooms because they're having recurrent acute attacks, there is a horrible emotional impact on kids and parents, and the financial costs to both health care and the economy are huge."

Mellema became so interested in asthma that he decided to learn how to perform advanced lung research himself. He combed through the piles of asthma-related research papers that he'd collected and identified schools where the best scholarship was being done. He chose to come to HSPH.

Mellema is now investigating the genetic basis of asthma risk in one of the laboratories that produced much of the research he had studied earlier. After graduating he hopes to teach physiology at the college level and continue his asthma research.

Division of Public Health Practice

The Division of Public Health Practice serves as a conduit between the work of HSPH academic departments, governmental and corporate agencies, and the community. The mission of the division encompasses education, research, and service. Through education the division ensures that its students graduate with the core competencies of public health, including assessment, policy formulation, and quality assurance, and with the vision to become effective public health leaders. Through research the division advances current methods of collaborative inquiry to evaluate questions raised in community-based public health practice, as well as to address the broader policy issues concerning the health effects of social inequality. Through service the division enhances the health of underserved communities by fostering collaborative efforts between HSPH faculty, staff, and students and community-based organizations, health departments, health care providers, and public schools to develop and implement sustainable innovative strategies.

Programs included under the umbrella of the division are the Yerby Postdoctoral Fellowship Program, the Office of Government and Community Programs, the Program for Health Care Negotiation and Conflict Resolution, the Program to Eliminate Health Disparities, and the Violence Prevention Program.

Interdisciplinary Concentration in Molecular Epidemiology

Molecular epidemiology, which encompasses a novel approach to the study of disease occurrence, is a focus of attention in several of the school's departments. Faculty members in the Department of Cancer Cell Biology, for example, use a molecular approach to study constitutional and somatic genetic alterations associated with cancer susceptibility, disease progression, and tumor biology. In the Department of Environmental Health, ongoing research utilizes biomarkers of exposure and exposure-related disease, as well as gene-environment interaction. The Department of Epidemiology is conducting molecular research in disease mechanism, outcome, and susceptibility. Members of the Department of Biostatistics are developing new methods for understanding molecular and genetic parameters governing disease occurrence. Finally, researchers in the Department of Nutrition are examining whether variation in enzymes that metabolize nutrients alter the relations of diet and disease. Prospective doctoral students must apply to one of the participating departments, and the degree will be issued from that department. Students are responsible for completion of degree requirements of the home department in addition to the program's core requirements in biology, genetics, exposure assessment, and epidemiology.

Interdisciplinary Concentration in the Epidemiology of Infectious Disease

Education and research on aspects of infectious disease occur in a number of HSPH departments, including the Departments of Environmental Health, Epidemiology, Immunology and Infectious Diseases, Nutrition, and Population and International Health. These departments participate in the interdisciplinary concentration in the epidemiology of infectious disease, which focuses on population studies incorporating both epidemiologic and laboratory methods. This doctoral program is intended for those students who desire careers in research and teaching in infectious disease. Prospective students must apply to one of the participating departments, and the degree will be issued from that department. Students are responsible for fulfilling the doctoral requirements of the home department in addition to the program's core requirements in biology, quantitative methods, and substantive infectious disease.

Interdisciplinary Concentration in Women, Gender, and Health

This interdisciplinary doctoral concentration is geared toward students who desire careers in research, teaching, and programs related to women, gender, and health. The concentration focuses on relevant concepts, methods, and evidence; the impact of gender, biology, and gender inequality on both women's and men's health is also considered. Prospective students must apply to one of the participating departments (Epidemiology, Health and Social Behavior, Maternal and Child Health, and Population and International Health). Students must fulfill the doctoral requirements of the home department, which issues the degree, in addition to required core courses and related offerings in women, gender, and health.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Women, Gender, and Health

Advanced Topics in Women, Gender, and Health

Women, Gender, and Health: Critical Issues in Mental Health

Research Centers

The school has established several institutes and centers to advance research in areas of importance to public health. These efforts tend to be multidisciplinary in their approach, bringing together faculty members from several HSPH departments and in some cases from several faculties at Harvard University. Faculty affiliated with the centers offer courses in their field of interest through the school's academic departments and often provide opportunities for student involvement in research. Research centers currently include the Center for Biostatistics in AIDS Research, Center for Health Communication, Center for Quality of Care Research and Education, François-Xavier Bagnoud Center for Health and Human Rights, Harvard AIDS Institute, Harvard Center for Cancer Prevention, Harvard Center for Population and Development Studies, Harvard Center for Risk Analysis, Harvard Center for Society and Health, Harvard Education and Research Center for Occupational Safety and Health, Harvard Injury Control Research Center, John B. Little Center for Radiation Sciences and Environmental Health, and Kresge Center for Environmental Health.

CONTACT INFORMATION

For the PhD Program in Biological Sciences in Public Health, on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4470
Fax: 617-432-4033
E-mail: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/bph/

For more information on the Division of Public Health Practice or the programs sponsored by the division, please contact Betty Johnson, assistant director for training and curriculum development, Division of Public Health Practice, 1552 Tremont Street, Boston, MA 02120.
Phone: 617-496-8064
Fax: 617-495-8543
E-mail: bljohnso@hsph.harvard.edu

For more information about research and training in molecular epidemiology, please contact Karl T. Kelsey, MD, MOH, Department of Cancer Cell Biology, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3313
Fax: 617-432-0107
E-mail: kelsey@hsph.harvard. Edu

For more information about research and training in the epidemiology of infectious disease, please contact George R. Seage, MPH, DSc, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4567
Fax: 617-566-7805
E-mail: gseage@epinet.harvard.edu

For more information about research and training in women, gender, and health, please contact Corrine Williams, Department of Maternal and Child Health, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-3690
Fax: 617-432-3755
E-mail: williams@hsph.harvard.edu

Academic Summer Programs

Summer Program in Clinical Effectiveness

The Summer Program in Clinical Effectiveness—affiliated with Brigham and Women's Hospital, Massachusetts General Hospital, and Harvard Medical School—is intended for physicians who have completed their residencies and wish to obtain the quantitative and analytical skills needed for careers in clinical research. Candidates must be fellows or faculty members and are usually sponsored by their clinical departments or divisions.

Students attend an intensive, seven-week, 15-credit summer program, comprising courses in biostatistics, epidemiology, and health policy and management. Upon completion of the summer program, qualified participants who apply and are admitted to a degree program may apply these academic credits toward the requirements for either a master of public health (MPH) or a master of science (SM) degree.

HSPH offers two specifically relevant degree programs: the MPH with a concentration in clinical effectiveness and the SM in epidemiology, with an area of interest in clinical epidemiology. Qualified participants may fulfill requirements for the SM in epidemiology or the MPH in clinical effectiveness by attending classes during a second summer period (for the SM) or during second and third summer periods (for the MPH), and by completing a supervised research project.

Summer Session for Public Health Studies

The Harvard Summer Session for Public Health Studies introduces students to the core areas of public health in two intensive sessions. Courses in the program help students develop the ability to define, assess, and evaluate the health needs of populations; to participate in the development of health policy; and to ensure the delivery of health services.

Students in the Summer Session attend one or two sessions in July and August. The 2002 curriculum includes courses in biostatistics, epidemiology, health care management, health policy, ethics, environmental health, and social and behavioral science. Each course offers 2.5 credits, and the maximum recommended course load is 5 credits (two courses) per session. Because the course work is very intensive and fast-paced, students registered for two courses in a session should not have other work commitments.

The Summer Session is intended for health professionals in training or those who are considering a midcareer change into public health and feel the need to develop their skills. Participants include public health professionals, primary care practitioners, physicians engaged in the evaluation of health care delivery and management, physicians in training (including preventive medicine residents and medical students in an MD/MPH joint-degree program), and candidates for a part-time MPH program. Students accepted for admission to an HSPH degree program may choose to begin their studies early by enrolling in the Summer Session; these students will have greater flexibility in course selection during the academic year. Other students may subsequently seek admission to an HSPH degree program. Students eligible for the MPH in the quantitative methods or clinical effectiveness concentrations may apply for a summer-only MPH, which must be completed in three consecutive summers.

RELATED OFFERINGS

Clinical epidemiology area of interest, Department of Epidemiology, see page 21.

MPH concentrations in clinical effectiveness and in quantitative methods, see pages 54–55.

CONTACT INFORMATION

For information about the Summer Program in Clinical Effectiveness, or to request application materials, please contact Barbara Rosen, Division of General Medicine, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115.
Phone: 617-732-5648
Fax: 617-732-5344
E-mail: brosen@partners.org

For more information about the Summer Session, please contact Hildi Keary, administrative assistant for summer programs, Office of Enrollment Services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1052
Fax: 617-432-2009
E-mail: hkeary@hsph.harvard.edu
(specify Summer Session on subject line)
Web: http://www.hsph.harvard.edu/summer/brochure

For more information about the summer-only MPH degree program, please contact Roberta Gianfortoni, director for professional education, Office for Professional Education, 677 Huntington Avenue, Boston MA 02115.
Phone: 617-432-0090
Fax: 617-432-3365
E-mail: rgianfor@hsph.harvard.edu

Degree Programs, Admission, & Enrollment

Degree Programs

The Harvard School of Public Health offers a number of degrees and degree programs (see inside front cover), reflecting a rich educational and research environment for students of many backgrounds and interests.

The degree programs have varying purposes and requirements. Some master's programs are intended to prepare students for professional careers in public health; others focus on research training in preparation for doctoral study. The doctoral programs are designed for students with interests in the scientific basis of public health and preventive medicine who wish to pursue academic or research positions.

Schoolwide Degree Requirements

All HSPH degree programs require the completion of some course work intended to ensure basic competencies in public health sciences.

For all professional master's degree programs, students must fulfill core requirements in biostatistics, epidemiology, environmental health sciences, health services administration, and social and behavioral sciences. In addition, students must complete a culminating experience, demonstrating integration of public health knowledge, and/or a practice experience. For research-oriented master's degree programs, students must fulfill the core requirements in biostatistics and epidemiology.

Students in HSPH doctoral programs must adhere to the doctoral timetable for maintaining satisfactory progress and must fulfill the following schoolwide requirements: completion of course work in one major field (20 credits) and two minor fields (10 credits each) and courses in introductory epidemiology and intermediate biostatistics; completion of the schoolwide oral qualifying examination, usually by the end of the second year (some departments also require a written qualifying examination); completion of a program of independent and original research in one of the basic disciplines of public health; the presentation and submission of this research in a thesis and the public defense of the thesis; and payment of at least two years of full-time tuition and one year of full-time reduced tuition.

Prospective students should consult the descriptions in this catalog for more information about particular programs and their specific admission and degree requirements. The Student Handbook, distributed during fall registration, also provides detailed information about requirements, timetables, and procedures.

Admission to Degree Programs

The admissions information in this section pertains to applications for degree programs offered by the Harvard School of Public Health. Applicants should contact the Admissions Office or consult the Web for complete instructions and application forms.

Note that application forms for PhD programs, offered under the auspices of the Graduate School of Arts and Sciences (GSAS), are different from those used by applicants to programs administered by HSPH; these forms must be obtained directly from GSAS. The GSAS application deadline is December 16, 2002.

HSPH Application Deadlines

December 15, 2002, is the deadline for complete applications for all HSPH doctoral (SD and DPH) and master of science (SM) programs.

December 15 is also the deadline for applications to the MPH and MOH programs in the priority admission cycle. February 15, 2003, is the deadline for completing applications to MPH and MOH programs for review in a second cycle. Applicants should be aware that these degree programs may fill to capacity during the priority admission cycle.

Participants in the Summer Clinical Effectiveness and Summer Session programs matriculating in the 2003 summer program and wishing to apply for degree candidacy must meet application deadlines outlined above.

Applicants to the MPH or MOH programs who wish to participate in the Occupational and Environmental Medicine Residency must apply by September 1, 2002.

Application Procedures and Requirements

Only applications that are complete will be processed and reviewed for admission. For an application to be considered complete, the Admissions Office must receive the following application materials by the deadlines indicated above:

- A completed and signed application form, a resume, and a 500-word essay written by the applicant. The essay should describe the applicant's academic and professional history, area of interest at HSPH, reasons for wanting to enroll in the degree program, and professional or academic career plans upon completion of the program.
- Official transcripts from all colleges, graduate schools, and/or professional schools attended, whether or not the courses taken appear to be relevant to a degree in public health. Applicants are expected to have a distinguished undergraduate record, as well as excellent performance in any graduate work undertaken.
- Letters of recommendation from at least three people who are well acquainted with the applicant's academic work and/or professional experience (recommendation forms are provided in the application packet).
- Official scores of the Graduate Record Examination (GRE). While GRE scores are strongly preferred, some other tests may be substituted in circumstances specified in the application packet. The requirement for scores from a standardized test will not be waived on the basis of academic or professional background.
- Official scores of the Test of English as a Foreign Language (TOEFL), if applicable. Applicants (including those who have been U.S. citizens or permanent residents for less than one year) from countries where English is not the language of instruction must submit a score from the TOEFL. Those who have already taken the TOEFL may submit the score as long as it is not more than two years old.
- A nonrefundable application fee of U.S. $60, in the form of a check drawn on a bank in the United States, a postal money order, or an international money order payable to the Harvard School of Public Health.

Applicants may apply to only one degree program and must satisfy the requirements of the department or program to which they are applying. Individuals wishing to apply for a joint degree in two departments should submit a petition requesting consideration by both departments; requirements for admission to both must be satisfied. Applicants to doctoral programs must demonstrate the ability to undertake original research. All prospective students must apply for either full-time or part-time status. Most international students are eligible for full-time study only.

Admission is granted for the fall semester of a particular year (currently September 2003). Students unable to enroll at that time may request a deferral but may be required to reapply. Applicants who require an early decision should adhere to the application deadlines for the year before the one in which they wish to enroll (for example, they may apply during the winter of 2002–03 for admission in September 2004).

Application Review

Applicants are notified as soon as possible (in writing) about the status of their application. The Admissions Office will either confirm that an application is ready for review or will specify any missing documents. The decision of the Committee on Admissions and Degrees is final and is not subject to appeal.

For all HSPH programs the Committee on Admissions and Degrees considers the academic ability of applicants, the relevance of their previous education and experience, and their overall qualifications for graduate education in public health, including those qualities of character that reflect upon an individual's suitability to be a public health professional. In decisions about admission and financial aid, HSPH does not discrimi-

Tuition and Fees, July 2002–June 2003

Tuition for full-time master's degree students and special students	
(20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)	$26,300 per year
Tuition for part-time master's degree students, special students, and affiliates	
(1–19 credits per semester, fall and spring, with a maximum of 15 summer credits. Part-time students may accrue 45 credits for the comparable full-time tuition rate.)	$ 660 per credit
Tuition for nonresidential master of science in health care management	
(2002–04 cohort)	$28,500 for program
Tuition for full-time resident doctoral students	
(20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)	
Full-time, years 1 and 2	$26,300 per year
Full-time reduced, year 3	$13,150 per year
Facilities fee, year 4 to thesis defense	$ 3,330 per year
Thesis defense fee (final semester before graduation)	$ 1,400 one semester
Tuition for part-time resident doctoral students	
Credits 1–80	$ 660 per credit
Credits 81–120	$ 330 per credit
Credits 121 to thesis defense	$ 85 per credit
Thesis defense fee (final semester before graduation)	$ 1,400 one semester
Tuition for nonresident doctoral students, full-time or part-time	$ 1,760 per year
Tuition for summer session 2002	$ 660 per credit
Fees	
Registration fee (summer, fall, spring)	$ 125 per semester
Late registration fee	$ 80
Late add/drop/change fee	$ 80 per petition
Leave of absence fee	$ 125 per semester
Health fees (see page 62)	

Note: Tuition rates are given in 2002–03 tuition dollars. Continuing students should expect annual increases.

nate against individuals on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or disability.

Recruitment of Minority Students

The increased participation of underrepresented groups in public health practice and research is essential to the advancement of health, and the school is committed to expanding the diversity of its faculty, staff, and student body. Members of U.S. minority groups are urged to identify themselves for special recruitment efforts by the Admissions Office.

Tuition Deposit and Financial Certification

Applicants who are granted admission must submit a $500 tuition deposit when confirming acceptance of the offer of admission. This deposit, which is nonrefundable, will be applied toward the student's tuition and fees.

Accepted applicants who are not U.S. citizens or permanent residents must demonstrate that sufficient funds are available in U.S. currency to pay the costs (tuition, fees, and living expenses) of the full period of their academic program. International students supported by personal, family, or sponsors' funds not paid directly to Harvard University are required to deposit and retain adequate funds in a Boston-area bank in an account bearing the student's name. Students bringing their families to the United States must transfer and certify adequate funds for their support as well. (Please see page 63 for an estimate of living expenses in the Boston area.)

Admission to Nondegree Status

Affiliates

Harvard faculty and staff, employees of Harvard-affiliated hospitals, HSPH alumni, and certain other Boston-area public health professionals may register for a maximum of 10 credits per semester as nondegree affiliates of the school. Affiliates must register in person at the HSPH Registrar's Office. Please call the Registrar's Office at 617-432-1032 to learn the exact dates for affiliate registration.

Enrollment of affiliate students in specific courses is subject to the availability of space and permission of the instructor and the registrar; if classes fill to capacity, preference is given to HSPH degree candidates. Payment is on a per-credit basis and is due at the time of registration. Payment is not refundable unless the student is unable to take the desired course because it is filled to capacity. Affiliate students may neither audit courses nor cross-register at other Harvard schools or MIT.

Special Students

Individuals who do not fall into one of the categories listed above may apply for special student status. Applicants for special student status are subject to the same admission and registration requirements, deadlines, and procedures as applicants for degree candidacy. U.S. citizens and permanent residents may apply to the Admissions Office for full-time or part-time special student status. As noted previously, foreign applicants are eligible for full-time status only. Admission to special student status is limited to one academic year. The deadline for applying for special student status is December 15, 2002.

Subsequent Application for Degree Candidacy

Affiliates and special students wishing to be admitted to degree candidacy must apply and will be considered on the same basis as other applicants for admission. At the time of their application, affiliates and special students who have taken courses at the school within the preceding three years may count up to 20 credits retroactively as part of the academic credit requirements.

Health Fees, September 2002–August 2003

University Health Services (UHS) Fee	Semester	Year
Individual	$ 510.00	$ 1,020.00
Family (student plus spouse)		2,304.00
Family (student plus spouse and one child)		3,324.00

The University Health Services (UHS) provides comprehensive prepaid medical care such as physical examinations, physician visits, laboratory tests, psychological counseling, and emergency services. The UHS fee is compulsory for all degree candidates and special students registered for more than 10 credits in a semester. Others may elect to waive UHS coverage; this must be done before the first day of fall registration.

Blue Cross/Blue Shield (BC/BS) Medical Insurance	Semester	Year
Individual	$ 375.00	$ 750.00
Family (student plus spouse)		1,692.00
Family (student plus spouse and one child)		2,448.00

The Blue Cross/Blue Shield (BC/BS) plan provides extensive benefits for ambulatory and inpatient care not offered at UHS. BC/BS coverage is compulsory for all nonimmigrant international students and for all other students who do not have comparable insurance. International students whose spouse and/or children will also be living in the United States are required to enroll in the family plan. U.S. students who have comparable insurance may elect to waive BC/BS coverage; this must be done before the first day of fall registration.

Note: UHS and BC/BS coverage extends from September 1 through August 31.

Up to 20 credits of tuition previously paid to HSPH may be counted toward the school's tuition requirement for the degree program. Students whose credits as a cross-registrant from another school are transferred to their program at HSPH must pay tuition to HSPH for those credits.

Financial Aid

Estimated Student Expenses

The budget information on page 63 is intended to provide students with an estimate of how much it will cost to spend nine months at HSPH. These figures are for the 2002–03 academic year; applicants for subsequent years should anticipate increases.

Matriculation in Summer Programs

Tuition for the Clinical Effectiveness Program and the Summer Session for Public Health Studies in 2002 is $660 per credit. HSPH offers a special program in English communication in advance of the regular orientation for entering students; tuition for the English communication program is $800 for summer 2002. Health fees and insurance for summer 2002 are $247.33 for two months, and living expenses, including rent, are about $1,550 a month.

Sources of Financial Aid

The Office of Student Financial Services and academic departments make every effort to assist students in finding resources to finance their education at HSPH. It should be noted that the school's need-based grants are extremely limited. Students are urged to investigate all sources of support, including employers, government agencies, and civil and religious organizations.

Financial aid is available in the form of grants, scholarships, loans, and work programs, as follows:

Grants and scholarships Some departments may have grants or departmental scholarships that cover partial or full tuition; some grants also provide a stipend. Eligibility is generally based on career goals, academic merit, experience, and U.S. citizenship or permanent residency. Please contact the department to which you are applying for additional information.

The university offers a number of restricted scholarships to students who meet specific criteria. Please refer to the HSPH financial aid application packet for more information. An HSPH application for financial aid is required.

Federal student loans The Office of Student Financial Services administers the Federal Direct Loan and Federal Perkins Loan programs. The maximum amount a student may receive under the Direct Loan program is $18,500 per academic year. Students with extreme financial need may also be eligible for a Perkins Loan up to $6,000. To apply for these loan programs, a student must

- be a U.S. citizen or permanent resident
- not be in default on a prior federal loan or owe a refund on a federal student grant
- be enrolled at least half-time (10 or more credits per semester)
- complete the financial aid application process

Alternative student loans The Office of Student Financial Services works with lending institutions to offer credit-based educational loans to students whose educational expenses exceed the amount of the base federal loan package. These loans are the last resort a student should utilize as the interest rate and repayment terms are not so favorable as the federal loan programs. International students with a U.S. citizen or permanent resident co-signer may be able to utilize these programs.

Work programs Some students may obtain part-time employment as research or teaching assistants in their academic departments. Additionally the school participates in the Federal Work-Study Program, which subsidizes between 50 percent and 75 percent of the on- or off-campus employer's costs. Eligibility for this program is the same as for federal student loans.

Please refer to the instruction booklet that accompanies the financial aid application forms for additional information about loan and work programs.

Registration

Students receive course descriptions and information about course meeting times, registration procedures and requirements, course load requirements, and payment of tuition and fees prior to registration. Every resident degree candidate is expected to register in person on the date specified (September 3 for new students and September 6 for returning students in academic year 2002–03).

Cross-Registration

HSPH students may enroll in courses offered by the other Harvard faculties, the Massachusetts Institute of Technolo-

gy, and the Fletcher School of Law and Diplomacy at Tufts University. Students intending to cross-register should be aware that registration deadlines and academic calendars vary from school to school; these students must conform to the registration requirements of the school into which they are cross-registering as well as those of HSPH. HSPH policies on cross-registration may be found at the following Web address: http://www.hsph.harvard.edu/registrar/xreg/index.shtml

Harvard University maintains an on-line catalog of all courses offered at the university. This catalog is searchable by school, topic, time, and instructor. Also listed at this site are relevant, school-specific cross-registration policies and credit equivalencies. The address for the site is the following: http://crossreg.harvard.edu/OASIS/CrossReg/index.html

CONTACT INFORMATION

For information about registration or admission to affiliate status, please contact the HSPH Registrar's Office, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1032
Fax: 617-432-2009
E-mail: registra@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/registrar

For more information about student health insurance, please contact the Student Insurance Office, Harvard University Health Services, 75 Mt. Auburn Street, Cambridge, MA 02138.
Phone: 617-495-2008
Fax: 617-496-6125
Web: http://www.uhs.harvard.edu

For the PhD program on-line submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the Web address below.
Web: http://www.gsas.harvard.edu/admissions/apply.html

For more information on HSPH-affiliated PhD programs, please visit the Harvard School of Public Health Web address below. Be sure to check off PhD on the form.
Web: http://www.hsph.harvard.edu/admissions/request.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4470
Fax: 617-432-4033
E-mail: bph@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/bph/

2002–03 Student Expense Budget (9 months)

Full-time tuition[1]		$26,300
University Health Services fee[2]	$510 per semester	$ 1,020
BC/BS health insurance fee[3]	$375 per semester	$ 750
Registration fee	$125 per semester	$ 250
Books/supplies	$600 per semester	$ 1,200
Living allowances		
Rent/utilities	$900 per month	$ 8,100
Food	$280 per month	$ 2,520
Personal	$330 per month	$ 2,970
Local transportation	$ 55 per month	$ 495
SUBTOTAL[4]		**$43,605**
Federal student loan fees[5]	3%	$ 555
TOTAL		**$44,160**

1. For part-time students, tuition charges are assessed based upon the number of credits for which a student is registered. For 2002–03, the charge is $660 per credit hour. Please refer to the HSPH Tuition and Fees Schedule for more information on billing procedures and payment requirements for part-time students. This is available from the HSPH Registrar's Office by calling 617-432-1032.

2. Part-time students taking 10 credits or fewer may waive the University Health Services fee if a waiver form is completed prior to registration.

3. The BC/BS health insurance fee can be waived upon proof of comparable coverage. The waiver form must be submitted prior to registration. Students with a spouse and/or children may request family coverage at a fee of $1,692 for an individual with one dependent or $2,448 for an individual with two or more dependents.

4. International students in the 40-credit programs must be able to demonstrate support of this level ($43,605) prior to the issuance of an appropriate visa. Other master's degree and doctoral candidates must demonstrate a 12-month support level of at least $48,030. Students with additional family members must demonstrate the following levels of support:

9-month	12-month	9-month	12-month
Student & spouse	Student & spouse	Student, spouse, & 1 child *	Student, spouse, & 1 child*
$49,745	$55,475	$54,445	$61,630

*For each additional child, add $1,485 for the 9-month and $1,980 for the 12-month budget.

5. Loan fees are based on borrowing $18,500 in Federal Direct Loans, available to U.S. citizens and permanent residents only.

Prospective degree candidates or special students who wish to request application materials, have questions about admission requirements, require assistance with the application process, or wish to visit the school should contact HSPH Admissions Office, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1031
Fax: 617-432-2009
E-mail: admisofc@hsph.harvard.edu

On-line application information and forms are also available on the admissions page of the HSPH Web site.
Web: http://www.hsph.harvard.edu/admissions

For more information about billing procedures or the financial aid application process, please contact the HSPH Office of Student Financial Services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1867
Fax: 617-432-2009
E-mail: osfs@hsph.harvard. edu
Web: http://www.hsph.harvard.edu/osfs

Student Life

Boston, Massachusetts

The Harvard School of Public Health is located in Boston, Massachusetts, an important center of American history, culture, commerce, and education. Boston is New England's largest and one of America's oldest cities. A wealth of historical buildings and sites evokes the city's colonial past while providing a striking contrast to the skyscrapers of the business district. The Boston area is home to more than sixty colleges and universities and many renowned teaching and research hospitals.

The area hosts major art museums, museums devoted to science and children, the famous Boston Symphony and Boston Pops, several professional theater companies, and six professional sports teams. The city also offers elegant shopping and diverse dining, from casual ethnic restaurants to haute cuisine. Compact in scale, Boston invites walking but furnishes extensive public transportation.

The proximity of Cape Cod and Maine beaches, the mountains of Vermont and New Hampshire, and the charming villages of New England add to the appeal of Boston, one of America's most desirable places to live and study.

Harvard University

Founded in 1636, Harvard University is the oldest institution of higher learning in the United States. It has educated six presidents of the United States, and its faculty has produced more than thirty Nobel laureates. Today Harvard has an enrollment of more than 18,000 degree candidates, and an additional 13,000 students are enrolled in the Harvard Extension School. Including HSPH, the university has ten graduate and professional schools. Its ninety individual collections constitute the largest academic library in the world, and ten art and science museums further enrich the quality of intellectual life.

The university has campuses both in Cambridge, Massachusetts, and in Boston.

Resources and Services for HSPH Students

The school's main buildings for research, teaching, and administration are located in the heart of Boston's hospital district and Harvard University's Longwood campus. The facilities adjoin those of Harvard's Medical School, School of Dental Medicine, and Francis A. Countway Library of Medicine and are near Children's Hospital Medical Center, Beth Israel Deaconess Hospital, Brigham and Women's Hospital, and other Harvard-affiliated hospitals. The school is within walking distance of many cultural institutions, such as Boston's Museum of Fine Arts, and public transportation is readily available to other parts of Boston and Cambridge, where students may cross-register for courses at other Harvard schools and at MIT. A shuttle bus runs between the Longwood campus and Harvard Yard in Cambridge.

Francis A. Countway Library of Medicine

The Countway Library is the principal provider of library services to the school. In this library are the combined resources of the Harvard Medical Library and the Boston Medical Library. The Countway is one of the largest medical libraries in the country and houses over 630,000 bound volumes and 3,500 current journal titles. The library's Web site provides access to more than 500 full-text journals in the biosciences and medicine and to many electronic databases. The Countway also owns an extensive collection of historical materials dating from the fifteenth century. Students have borrowing privileges throughout the Harvard University library system. The Boston Public Library, MIT

libraries, and other area libraries add to the total book and periodical resources available.

Instructional Computing Facility

The HSPH Instructional Computing Facility is dedicated to serving the course work and research computing needs of the school's students and faculty. Resources include SUN Unix computers, 125 IBM personal computers, a Novell network, laser printers, a 35-mm slide maker, and an OCR scanner; a wide array of software, including statistical packages, programming languages, analytical programs, and word-processing packages; and services such as remote dial-in, file transfer, electronic mail, connections to the Internet, user assistance, short courses, and computer accounts for funded research. Many academic departments also provide computing resources for their students. Additional services, such as computer classes, discounted hardware and software, user groups, and technical support, are available through the offices of Harvard's University Information Systems.

Office for Students and Alumni

The Office for Students and Alumni provides a variety of support services and offers educational, social, and cultural programs to enhance the student experience at HSPH. Staff members are available to respond to the needs of individual students as they deal with the many demands of their academic and personal lives. The office also works closely with student government and other student groups to address collective student concerns. The provision of career services, administration of the school's residential facilities, assistance to students with disabilities, and liaison to alumni are encompassed within this office.

The office sponsors noncredit academic support seminars on such topics as general and dissertation writing, as well as Global Chat, a weekly lunchtime meeting that gives international students an opportunity to practice their English while learning about each others' native countries. The office collaborates with the student offices of other graduate faculties at Harvard and cosponsors Graduate Students Learning Support programs and other student development initiatives. Staff members in the Office for Students and Alumni are available to meet with students to discuss personal or academic problems and to help students and their families who have questions about living in Boston and the United States. The Office for Students and Alumni also assists foreign students in adjusting to life in the United States.

Career Services Office The Career Services Office offers counseling, employment resources, and networking opportunities to assist students and alumni in expanding their employment prospects. The office invites numerous organizations to campus, both to present information sessions and to interview prospective job applicants; organizations searching for employees are able to examine electronic resume books. The career services staff conducts workshops on resume and cover-letter writing, job search strategies, and interviewing/negotiating skills and organizes panel discussions featuring public health professionals and HSPH alumni. Students and alumni have access to current on-line job postings and to fellowship and internship opportunities. The Career Services Office Resource Room contains job listings, resource directories, and other career-related information. The office also maintains the Alumni Career Advisory Network, an on-line database of alumni willing to advise students and fellow alumni on various career issues.

Office of Alumni Programs The Office of Alumni Programs acts as a liaison between 9,500 HSPH alumni and school faculty, students, and administrators. The office develops and implements programs to facilitate alumni access to university resources and serves as a networking forum for students, alumni, faculty, and outside constituencies. A newly established alumni mentor program links current students with their alumni counterparts. In addition, HSPH alumni are available to answer questions that potential applicants may have about departments, curricula, and possible career opportunities. The office publishes the HSPH Alumni Directory and disseminates information about programs and events organized by the Harvard Alumni Association. The Office of Alumni Programs also works with the HSPH Alumni Association and the Alumni Council, the association's elected governing body, to organize regional gatherings in the United States and abroad and raise funds for student scholarships and travel grants.

Student housing The Henry Lee Shattuck International House is operated by the school on a nonprofit basis for its full-time students and their families. In addition to providing living quarters, the facility offers a supportive environment for HSPH students. Located within a ten-minute walking distance of the school, the apartment complex consists of three buildings with seventy furnished studio, one-, and two-bedroom apartments that accommodate single students, roommates, and families. Several apartments are wheelchair accessible. All apartments have private kitchens and baths, free Internet and E-mail access via a data link to the school, two available telephone lines, and interior cable access.

Shared facilities include a computer room with a printer and copy machine, a library/reading room, an exercise room, a function room, a children's playroom, a laundry room, an indoor bicycle storage area, a piano room, a TV room, a recycling area, and an outdoor playground.

Demand for the apartments exceeds their availability. The Student Affairs Office places applicants in late May, and applicants are notified about the results in early June. A waiting list is maintained throughout the summer and fall for applicants who are not assigned an apartment during the initial process. Applications are assigned the following order of priority: (1) new international students, (2) new U.S. students, (3) returning international students, and (4) returning U.S. students. When placing U.S. students, the office takes into account the distance of their current places of residence from Boston. The maximum length of residency is two years, assuming residents maintain full-time-student status. A partial year of residency counts as an entire year.

Students with disabilities The Office for Students and Alumni furnishes a range of services to disabled students, including interpreters and note takers, tape recordings of class readings, arrangements for appropriate accommodations and transportation, and special services as necessary.

Child Care Facilities

There are several child care facilities located near the Longwood and Cambridge campuses. Referrals and information are provided by the Harvard University Office of Work and Family and the Office of Work and Family at the Medical School. Arrangements should be made as early as possible, as facilities are quickly filled.

International Students

During the 2001–02 academic year, 34 percent of HSPH students were foreign citizens, representing 59 foreign countries. The experience international students bring to the school lends an important dimension to the academic program and adds to the diversity of the student population. International students organize many cultural events at the school and participate in the annual International Night talent show.

Harvard International Office The Harvard International Office, located on the Cambridge campus, provides a variety of services to students from abroad, including orientations, newsletters, and cross-cultural workshops. One program, the Friends of International Students, matches students with a person or family who will welcome them and ease their transition to the United States. International student advisers from the Harvard International Office hold weekly office hours at HSPH to assist students with visa matters and to advise them on immigration regulations.

Student Organizations

The Student Coordinating Committee (SCC) includes elected representatives from each department, from the MPH program, and from the Division of Biological Sciences. The SCC meets regularly to discuss issues and plan activities related to student life at HSPH and provides a mechanism for working with members of the school's faculty and administration on schoolwide issues, for sponsoring seminars and other educational programs, for organizing social activities, and for arranging for student representation on several of the school's faculty committees. The SCC frequently sponsors or cosponsors collaborative activities with the school and the neighboring community, including tutoring programs, toy drives, and an annual dinner-dance for senior citizens.

Various student organizations at HSPH geared toward the interests of specific constituencies include the HSPH Minority Student Health Organization (MSHO); the Spanish Speaking Committee; the Asian Club; Students of the African Diaspora; Women in Public Health; the Lesbian, Gay, Bisexual, and Transgender Alliance; and the Jewish Students Association. Other student organizations include the Health and Human Rights Committee and the Pharmacogenomics Group.

CONTACT INFORMATION

For more information about career services, please contact Peter Crudele, director of career services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1034
Fax: 617-432-3184
Web: http://www.hsph.harvard.edu/Admins/offstuds/career.html

For more information about alumni activities or alumni-applicant contacts, please contact Margaret Loret, director of alumni programs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2401
Fax: 617-432-4517
E-mail: mloret@hsph.harvard.edu

For more information about Shattuck House, housing alternatives, or services for disabled students, please contact the Student Affairs Office, 677 Huntington Avenue, Boston, MA 02115
Phone: 617-432-0488
Fax: 617-432-3184
Web: http://www.hsph.harvard.edu/housing

For more information about child care centers in the area, please contact the Office of Work and Family at 617-495-4100. The Medical Center Office of Work and Family at 617-432-1615 can also provide information on support services, resources, and programs.

For more information about services offered by the Harvard University International Office, please contact the Adviser to Foreign Students and Scholars, Harvard International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138.
Phone: 617-495-2789
Fax: 617-495-4088

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